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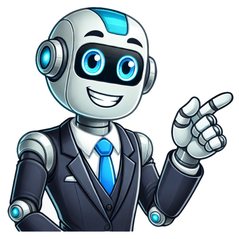

,the free encyclopedia that anyone can edit.110,331 active editors 7,023,278 articles in EnglishSchool in Sketty, Swansea, photographed in 1854The period between 1701 and 1870 saw an expansion in access to formal education in Wales, though schooling was not yet universal. Several philanthropic efforts were made to provide education to the poor during the 18th century. In the early to mid-19th century, charitable schools were established to provide a basic education. Private schools aimed at the working classes also existed. State funding was introduced to schools from 1833. Some use of the Welsh language was made in 18th-century philanthropic education, at a time when most agricultural workers in Wales spoke only Welsh. In the 19th century, public opinion was keen for children to learn English, and many schools punished children for speaking Welsh, though studies found such methods ineffective. The government did little to promote bilingual education. Grammar schools experienced difficulties and, by the end of the period, secondary education was limited. Dissenter academies and theological colleges offered higher education. (Fullarticle...)Recently featured: White dwarfBattle of GroixScott CarpenterArchiveBy emailMore featured articlesAboutT.brachyglossum seedheads... that Taraxacum brachyglossum (pictured) can reproduce both sexually and asexually, depending on environmental conditions?... that although Frederick Rondel was taught to paint by a French king's court painter, he chose to depict American landscapes like the Adirondack Mountains?... that a 19th-century water-pumping station is now a wedding venue?... that Washington University in St.Louis holds one of the few surviving printed broadsides of the United States Declaration of Independence?... that Jerzy Broszkiewicz, a louse-feeder during World WarII, later became a writer of youth literature and drama?... that Lorde wrote a song about herself titled "Man of the Year" the day after attending GQ's "Men of the Year" party in 2023?... that American football player Curtis Burrow, the fourth different kicker used by the Green Bay Packers in 1988, played one game before being released?... that Bukit Brown Cemetery is believed to be the largest Chinese cemetery outside of China, with over 100,000 burials?... that an eight-week UK number-one single co-written by Audrey Hobert has a sexually explicit version?ArchiveStart a new articleNominate an articleVera Rubin ObservatoryThe Vera C. Rubin Observatory (pictured) in Chile releases the first light images from its new 8.4-meter (28ft) telescope.In basketball, the Oklahoma City Thunder defeat the Indiana Pacers to win the NBA Finals.An attack on a Greek Orthodox church in Damascus, Syria, kills at least 25 people.The United States conducts military strikes on three nuclear facilities in Iran.In rugby union, the Crusaders defeat the Chiefs to win the Super Rugby Pacific final.Ongoing: Gaza warIranIsrael warRussian invasion of UkrainetimelineSudanese civil wartimelineRecent deaths: Lucien NedziAnne BurrellFrederick W. SmithRon TaylorMohammad KazemiMarita Camacho QuirsNominate an articleJune 25 Original rainbow flag1658 Anglo-Spanish War: The largest battle ever fought on Jamaica, the three-day Battle of Rio Nuevo, began.1910 The United States Congress passed the Mann Act, which prohibited the interstate transport of females for "immoral purposes".1944 World WarII: U.S. Navy and Royal Navy ships bombarded Cherbourg, France, to support U.S. Army units engaged in the Battle of Cherbourg.1978 The rainbow flag (original version pictured) representing gay pride was first flown at the San Francisco Gay Freedom Day parade.2009 Singer Michael Jackson died as a result of the combination of drugs in his body.Giovanni Battista Riccioli (d.1671)Elosa Daz (b.1866)George Michael (b.1963)Farrah Fawcett (d.2009)More anniversaries: June 24June 25June 26ArchiveBy emailList of days of the yearAbout1795 Turban Head eagle with original reverse1797 Turban Head eagle with heraldic eagle reverseThe Turban Head eagle was a ten-dollar gold piece, or eagle, struck by the United States Mint from 1795 to 1804. The piece was designed by Robert Scot, and was the first in the eagle series, which continued until the Mint ceased striking gold coins for circulation in 1933. The common name is a misnomer; Liberty does not wear a turban but a cap, believed by some to be a pileus or Liberty cap: her hair twisting around the headgear makes it appear to be a turban. The number of stars on the obverse was initially intended to be equal to the number of states in the Union, but with the number at 16, that idea was abandoned in favor of using 13 stars in honor of the original states. The initial reverse, featuring an eagle with a wreath in its mouth, proved unpopular and was replaced by a heraldic eagle. Increases in the price of gold made it profitable for the coins to be melted down, and in 1804, President Thomas Jefferson ended coinage of eagles; the denomination was not struck again for circulation for more than 30years. These Turban Head eagles are in the National Numismatic Collection at the National Museum of American History.Coin design credit: United States Mint; photographed by Jaclyn NashRecently featured: SpringbokGeraldine UlmarShah Mosque (Isfahan)ArchiveMore featured picturesCommunity portal The central hub for editors, with resources, links, tasks, and announcements.Village pump Forum for discussions about Wikipedia itself, including policies and technical issues.Site news Sources of news about Wikipedia and the broader Wikimedia movement.Teahouse Ask basic questions about using or editing Wikipedia.Help desk Ask questions about using or editing Wikipedia.Reference desk Ask research questions about encyclopedic topics.Content portals A unique way to navigate the encyclopedia.Wikipedia is written by volunteer editors and hosted by the Wikimedia Foundation, a non-profit organization that also hosts a range of other volunteer projects: CommonsFree media repository MediaWikiWiki software development Meta-WikiWikimedia project coordination WikibooksFree textbooks and manuals WikidataFree knowledge base WikinewsFree-content news WikiquoteCollection of quotations WikisourceFree-content library WikispeciesDirectory of species WikiversityFree learning tools WikivoyageFree travel guide WiktionaryDictionary and thesaurusThis Wikipedia is written in English. Many other Wikipedias are available; some of the largest are listed below. 1,000,000+ articles DeutschEspaolFranaisItalianoNederlandsPolskiPortugusSvenskaTing Vit 250,000+ articles Bahasa IndonesiaBahasa MelayuBn-lm-gCataletinaDanskEestiEsperantoEuskaraMagyarNorsk bokmlRomnSimple EnglishSlovenina SrpskiSrpskohrvatskiSuomiTrkeOzbekcha 50,000+ articles AsturianuAzrbaycancaBosanskiFryskGaeilgeGalegoHrvatskiKurdLatvieuLietuviNorsk nynorskShqipSlovenina Retrieved from " 2This article needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.Find sources:"1658"news newspapers books scholar JSTOR (January 2016) (Learn how and when to remove this message)Calendar yearYearsMillennium2ndmillenniumCenturies16thcentury17thcentury 18thcenturyDecades1630s1640s1650s 1660s1670sYears1655165616571658 165916601661vteJanuary 30: Swedish troops cross the frozen waters of the Danish straits on foot in the March Across the Belts1658 by topicArts and scienceArchitectureArtLiteratureMusicScienceLeadersState leadersColonial governorsReligious leadersBirth and death categoriesBirths DeathsEstablishments and disestablishments categoriesEstablishments DisestablishmentsWorks categoryWorksvte1658 in various calendarsGregorian calendar1658MDCLVIIIAb urbe condita2411Armenian calendar1107 Assyrian calendar6408Balinese saka calendar15791580Bengali calendar10641065Berber calendar2608English Regnal year9Cha.210Cha.2(Interregnum)Buddhist calendar2202Burmese calendar1020Byzantine calendar71667167Chinese calendar (FireRooster)4355 or 4148to (EarthDog)4356 or 4149Coptic calendar13741375Discordian calendar2824Ethiopian calendar16501651Hebrew calendar54185419Hindu calendars- Vikram Samvat17141715- Shaka Samvat15791580- Kali Yuga47584759Holocene calendar11658Igbo calendar658659Iranian calendar10361037Islamic calendar10681069Japanese calendarMeireki 4 / Manji 1()Javanese calendar15801581Julian calendarGregorian minus 10 daysKorean calendar3991Minguo calendar254 before ROC254Nanakshahi calendar190Thai solar calendar22002201Tibetan calendar(female Fire-Rooster)1784 or 1403 or 631to(male Earth-Dog)1785 or 1404 or 632June 14: Battle of the Dunes1658 (MDCLVIII) was a common year starting on Tuesday of the Gregorian calendarand a common year starting on Friday of the Julian calendar, the 1658th year of the Common Era (CE) and Anno Domini (AD) designations, the 658th year of the 2ndmillennium, the 58th year of the 17thcentury, and the 9th year of the 1650s decade. As of the start of 1658, the Gregorian calendar was 10 days ahead of the Julian calendar, which remained in localized use until 1923. Calendar year January 13 Edward Sexby, who had plotted against Oliver Cromwell, dies in the Tower of London.[1]January 30 The "March Across the Belts" (Tget ver Blt), Sweden's use of winter weather to send troops across the waters of the Danish straits at a time when winter has turned them to ice, begins. Within 17 days, Sweden's King Karl X Gustav leads troops across the ice belts to capture six of Denmark's islands as Swedish territory.February 5 Prince Muhi al-Din Muhammad, one of the sons of India's Mughal, Emperor Shah Jahan, proclaims himself Emperor after Jahan names Muhi's older brother, Dara Shikoh, as regent, and departs from Aurangabad with troops.February 6 Swedish troops of Charles X Gustav of Sweden cross The Great Belt in Denmark, over frozen sea.[2]March 8 (February 26 OS) The peace between Sweden and Denmark-Norway is concluded in Roskilde by the Treaty of Roskilde, under which Denmark is forced to cede significant territory. This leads to Sweden reaching its territorial height during its time as a great power.April 15 In India, the Battle of Dharmat is fought in the modern-day state of Madhya Pradesh between rival claimants to the throne of the Mughal Empire. Prince Muhi al-Din Muhammad, the son of the Emperor Shah Jahan, leads 30,000 men in a triumph over 22,000 troops led by Jaswant Singh of Marwar and Ratan Singh Rathore. Despite heavy losses, with more than 11,000 casualties, Prince Muhi, who has adopted the name Aurangzeb, continues toward Samugarh and Agra and captures the throne at the end of July.April 16 In Skneland, a region recently ceded by Denmark to the Swedish Empire, representatives of the nobility of the provinces of Blekinge, Halland and Scania gather at the Scanian city of Malm to swear their allegiance to King Charles X Gustav of Sweden.May 1 Hydriotaphia, Urn Burial and The Garden of Cyrus are published by Thomas Browne in England.May 29 Aurangzeb wins the Battle of Samugarh as Indian Mughal regent Dara Shikoh makes a last effort to defend the Mughal capital Agra.June 3 Pope Alexander VII appoints Franois de Laval vicar apostolic of New France.June 14 Anglo-Spanish War (165460) and Franco-Spanish War (163559): In the Battle of the Dunes, a Spanish force attempting to lift a siege of Dunkirk is defeated by the French and English. England is then given Dunkirk, for its assistance in the victory.June 2527 In the Battle of Rio Nuevo, part of the Anglo-Spanish War, a Spanish invasion force fails to recapture Jamaica from the English.July 2 The Siege of Toru begins in Poland as troops of the PolishLithuanian Commonwealth and of Austria seek to recapture the city of Toru from a garrison of the Swedish Army. Within six months, the Swedish occupiers surrender.July 18 Prince Leopold of the House of Habsburg, son of the late Ferdinand III, is elected as the new Holy Roman Emperor.July 31 After Shah Jahan completes the Taj Mahal, his son Aurangzeb deposes him as ruler of the Mughal Empire.July arhda's Manchu fleet annihilates Onufriy Stepanov's Russian flotilla, on the Amur River.August 1 The coronation of Leopold I takes place in Frankfurt.August 5 Just six months after winning territory from Denmark-Norway in war and subsequent treaty, Sweden's King Charles X Gustav declares a second war against Denmark. By August 11, the King's troops have surrounded Denmark's capital, Copenhagen, while the Swedish Navy blocks the harbor to prevent the city from being resupplied, and begins bombardment.August 14 The League of the Rhine (Rheinische Allianz) is formed by 50 German princes whose cities are on the Rhine river.September 3 Oliver Cromwell dies and his son Richard assumes his father's position as Lord Protector of England, Scotland and Ireland.September 17 Portuguese Restoration War: In the Battle of Vilanova, a Spanish army, having crossed the Minho, defeats the Portuguese.October 7 The Netherlands enters the Dano-Swedish War to come to the rescue of Denmark, sending a 45-ship fleet from Vlie.October 29 The 45-ship fleet of the Netherlands arrives at Denmark and begins its counterattack on Sweden's army and navy with three squadrons.November 6 The Mexican Inquisition carries out the execution, by public burning, of 14 men convicted of homosexuality, while another 109 arrested are either released or given less harsh sentences.November 8 (October 29 old style) The Battle of the Sound takes place between the navies of the Dutch Republic (with 41 warships) and of Sweden (with 45) at the resund, a strait between Denmark and Sweden's newly-acquired territory, the former Danish island of Scania. The Dutch Republic is successful at breaking the Swedish Navy's blockade of Copenhagen, and Sweden is forced to retreat, bringing an end to the attempted conquest of Denmark.November 23 The elaborate funeral of Lord Protector of England Oliver Cromwell (who had died on September 3 and was buried at Westminster Abbey two weeks later) is carried out in London. A little more than two years later (in January 1661), his body will be disinterred and his head severed and placed on a spike.December 11 Abaza Hasan Pasha, an Ottoman provincial governor who is attempting to depose the Grand Vizier, wins a battle at the Turkish city of Ilgin, defeating loyalist forces led by Murtaza Pasha. The victory is the last for the rebels. Two months later (February 16, 1659) Abaza Hasan is assassinated after being invited to peace negotiations by the loyalists.December 20 Representatives of the Russian Empire and the Swedish Empire sign the Treaty of Valiesar at the Valiesar Estate near Narva, part of modern-day Estonia. In return for ceasing hostilities between the two empires in the Second Northern War, Russia is allowed to keep captured territories in Livonia (part of modern-day Latvia) for a term of three years.December 25 Polish and Danish forces defeat a Swedish Army in the Battle of Kolding in Denmark.December 30 The Siege of Toru ends almost six months after it started, with Poland recapturing the city from Sweden.Portuguese traders are expelled from Ceylon by Dutch invaders.The Dutch in the Cape Colony start to import slaves from India and South-East Asia (later from Madagascar).Mary of ModenaJanuary 9 Nicolas Coustou, French artist (d. 1733)[3]January 17 Samson Wertheimer, European rabbi (d. 1724)January 17 Francis Seymour, 5th Duke of Somerset (d. 1678)February 18 Charles-Irne Castel de Saint-Pierre, French writer (d. 1743)March 5 Antoine de la Mothe Cadillac, French explorer (d. 1730)March 8 Thomas Trevor, 1st Baron Trevor, British Baron (d. 1730)March 23 Jean-Baptiste Santerre, French painter (d. 1717)March 30 Muro Kys, Japanese Neo-Confucian scholar (d. 1734)April 11 James Hamilton, 4th Duke of Hamilton, Scottish peer (d. 1712)April 19 Johann Wilhelm, Elector Palatine, German noble (d. 1716)April 22 Giuseppe Torelli, Italian violist, violinist, pedagogue and composer (d. 1709)May 30 Sir Henry Furnese, 1st Baronet, English merchant and politician (d. 1712)June 10 John March, Massachusetts businessman, colonel (d. 1712)June 11 Victor Honor Janssens, Flemish painter (d. 1736)June 22 Louis VII, Landgrave of Hesse-Darmstadt (d. 1678)July 10 Luigi Ferdinando Marsili, Italian soldier and naturalist (d. 1730)July 14 Camillo Rusconi, Italian artist (d. 1728)July 17 Diogo de Mendona Corte-Real, Portuguese politician (d. 1736)July 21 Alexis Littr, French physician and anatomist (d. 1726)July 25 Archibald Campbell, 1st Duke of Argyll, Scottish privy councillor (d. 1703)July 28 Roelof Diodati, Dutch Governor of Mauritius (d. 1723)August 1 Pierre Joseph Garidel, French botanist (d. 1737)August 5 Claude Audran III, French painter (d. 1734)August 10 Susanne Maria von Sandrart, German engraver (d. 1716)August 11 Sir Justinian Isham, 4th Baronet, English baronet and Member of Parliament (d. 1730)August 16 Jan Frans van Son, Flemish Baroque painter (d. 1704)August 16 Ralph Thoresby, British historian (d. 1725)August 18 Jan Frantiek Beckovsk, Czech historian (d. 1722)August 22 John Ernest IV, Duke of Saxe-Coburg-Saalfeld (d. 1729)August 28 Honor Tournly, French theologian (d. 1729)September 1 Jacques Bernard, French theologian and publicist (d. 1718)September 16 John Dennis, English dramatist and critic (d. 1734)September 24 Sir Robert Anstruther, 1st Baronet, Scottish politician (d. 1737)September 30 Elisabeth Eleonore of Brunswick-Wolfenbttel, Duchess consort of Saxe-Meiningen (d. 1729)October 2 Nicholas Roosevelt (16581742), Dutch-American politician (d. 1742)October 5 Mary of Modena, queen of James II of England (d. 1718)October 11 Christian Heinrich Postel, German jurist (d. 1705)October 18 Alexander of Courland, German prince (d. 1686)October 19 Adolphus Frederick II, Duke of Mecklenburg-Strelitz (d. 1704)October 21 Henri de Boulainvilliers, French nobleman (d. 1722)October 24 Marko Gerbec, Carniolan physician, scientist (d. 1718)November 2 Baptist Noel (MP), English politician (d. 1690)November 4 Sulkhan-Saba Orbeliani, Georgian prince, writer, monk and author (d. 1725)November 21 Johann Gottfried Roesner, Prussian burgomaster (d. 1724)November 27 Tsarevna Catherine Alekseyevna of Russia, daughter of Tsar Alexis of Russia (d. 1718)November 27 Hercule-Louis Turinetti, marquis of Pri (d. 1726)December 2 Sir Thomas Roberts, 4th Baronet, English politician (d. 1706)December 10 Lancelot Blackburne, Archbishop of York (d. 1743)date unknown Elizabeth Barry, English actress (d. 1713)John ClevelandWitte Corneliszoon de WithJanuary 1 Caspar Sibelius, Dutch Protestant minister (b. 1590)January 2 Sir William Armine, 2nd Baronet, English politician (b. 1622)January 7 Theophilus Eaton, English-born Connecticut colonist (b. 1590)January 13 Edward Sexby, English Puritan soldier (b. 1616)February 19 Henry Wilmot, 1st Earl of Rochester (b. 1612)March 25 Herman IV, Landgrave of Hesse-Rotenburg (b. 1607)February 27 Adolf Frederick I, Duke of Mecklenburg-Schwerin (15921628 and again 16311658) (b. 1588)March 29 Bertuccio Valiero, Doge of Venice (b. 1596)April 7 Juan Eusebio Nieremberg, Spanish mystic (b. 1595)April 19Kirsten Munk, second wife of Christian IV of Denmark (b. 1598)Robert Rich, 2nd Earl of Warwick, English colonial administrator and admiral (b. 1587)April 24 Francesco Maria Richini, Italian architect (b. 1584)April 29 John Cleveland, English poet (b. 1613)May 20 Bartholomew Holzhauser, German priest, visionary and writer of prophecies (b. 1613)June 18 Louis Cappel, French Protestant churchman and scholar (b. 1585)June 8 Sir Henry Slingsby, 1st Baronet, English baronet (b. 1602)June 27 Ercole Gennari, Italian drawer and painter (b. 1597)July 22 Frederick, Duke of Schleswig-Holstein-Snderburg-Norburg (b. 1581)August 5 Gundakar, Prince of Liechtenstein, court official in Vienna (b. 1580)August 6 Elizabeth Claypole, daughter of Oliver Cromwell (b. 1629)August 19 Christine of Hesse-Kassel, Duchess of Saxe-Eisenach and Saxe-Coburg (b. 1578)September 3 Oliver Cromwell, Lord Protector of England, Scotland, and Ireland (b. 1599)September 17 Kaspar von Barth, German philologist and writer (b. 1587)September 22 Georg Philipp Harsdrffer, German poet (b. 1607)October 14 Francesco I d'Este, Duke of Modena, Italian noble (b. 1610)October 23 Thomas Pride, Parliamentarian general in the English Civil WarNovember 4 Antoine Le Maistre, French Jansenist (b. 1608)November 6 Pierre du Ryer, French dramatist (b. 1606)November 7 Maeda Toshitsune, Japanese warlord (b. 1594)November 8 Witte de With, Dutch naval officer (b. 1599)November 26 Duke Francis Henry of Saxe-Lauenburg (b. 1604)November 29 Margrave Charles Magnus of Baden-Durlach (b. 1621)December 6 Baltasar Gracin y Morales, Spanish writer (b. 1601)December 15 Carlo Emanuele Madruzzo, Italian prince-bishop (b. 1599)December 20 Jean Jannon, French typefounder (b. 1580)Date unknown: Osoet Pegua, Thai businesswoman (b. 1615)^ "killing". Oxford Reference. Retrieved December 14, 2021.^ Brems, Hans (June 1970). "Sweden: From Great Power to Welfare State". Journal of Economic Issues. 4 (2, 3). Association for Evolutionary Economics: 116. doi:10.1080/00213624.1970.11502941. JSTOR4224039. A swift and brilliantly conceived march from Holstein across the frozen Danish waters on Copenhagen, by Karl X Gustav in 1658, finally wrests Bohuslin, Sk'ane, and Blekinge from Denmark-Norway. Denmark no longer controls both sides of Oresund, and Swedish power is at its peak.^ "Nicolas Coustou | French sculptor | Britannica". www.britannica.com. Retrieved December 14, 2021.Retrieved from " 3One hundred years, from 1501 to 1600This article needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed.Find sources:"16th century"news newspapers books scholar JSTOR (September 2022) (Learn how and when to remove this message)Millennia2ndmillenniumCenturies15thcentury16thcentury17thcenturyTimelines15thcentury16thcentury17thcenturyState leaders15thcentury16thcentury17thcenturyDecades1500s1510s1520s1530s1540s1550s1560s1570s1580s1590sCategories:Births Deaths Establishments DisestablishmentsvteThe world map by the Italian Amerigo Vespucci (from whose name the word America is derived) and Belgian Gerardus Mercator shows (besides the classical continents Europe, Africa, and Asia) the Americas as America sive India Nova', New Guinea, and other islands of Southeast Asia, as well as a hypothetical Arctic continent and a yet undetermined Terra Australis.[1]The 16th century began with the Julian year 1501 (represented by the Roman numerals MDI) and ended with either the Julian or the Gregorian year 1600 (MDC), depending on the reckoning used (the Gregorian calendar introduced a lapse of 10 days in October 1582).[1]The Renaissance in Italy and Europe saw the emergence of important artists, authors and scientists, and led to the foundation of important subjects which include accounting and political science. Copernicus proposed the heliocentric universe, which was met with strong resistance, and Tycho Brahe refuted the theory of celestial spheres through observational measurement of the 1572 appearance of a Milky Way supernova. These events directly challenged the long-held notion of an immutable universe supported by Ptolemy and Aristotle, and led to major revolutions in astronomy and science. Galileo Galilei became a champion of the new sciences, invented the first thermometer and made substantial contributions in the fields of physics and astronomy, becoming a major figure in the Scientific Revolution in Europe.Spain and Portugal colonized large parts of Central and South America, followed by France and England in Northern America and the Lesser Antilles. The Portuguese became the masters of trade between Brazil, the coasts of Africa, and their possessions in the Indies, whereas the Spanish came to dominate the Greater Antilles, Mexico, Peru, and opened trade across the Pacific Ocean, linking the Americas with the Indies. English and French privateers began to practice persistent theft of Spanish and Portuguese treasures. This era of colonialism established mercantilism as the leading school of economic thought, where the economic system was viewed as a zero-sum game in which any gain by one party required a loss by another. The mercantilist doctrine encouraged the many intra-European wars of the period and arguably fueled European expansion and imperialism throughout the world until the 19th century or early 20th century.The Reformation in central and northern Europe gave a major blow to the authority of the papacy and the Catholic Church. In England, the British-Italian Alberico Gentili wrote the first book on public international law and divided secularism from canon law and Catholic theology. European politics became dominated by religious conflicts, with the groundwork for the epochal Thirty Years' War being laid towards the end of the century.In the Middle East, the Ottoman Empire continued to expand, with the sultan taking the title of caliph, while dealing with a resurgent Persia. Iran and Iraq were caught by a major popularity of the Shia sect of Islam under the rule of the Safavid dynasty of warrior-mystics, providing grounds for a Persia independent of the majority-Sunni Muslim world.[2]In the Indian subcontinent, following the defeat of the Delhi Sultanate and Vijayanagara Empire, new powers emerged, the Sur Empire founded by Sher Shah Suri, Deccan sultanates, Rajput states, and the Mughal Empire[3] by Emperor Babur, a direct descendant of Timur and Genghis Khan.[4] His successors Humayun and Akbar, enlarged the empire to include most of South Asia.Japan suffered a severe civil war at this time, known as the Sengoku period, and emerged from it as a unified nation under Toyotomi Hideyoshi. China was ruled by the Ming dynasty, which was becoming increasingly isolationist, coming into conflict with Japan over the control of Korea as well as Japanese pirates.In Africa, Christianity had begun to spread in Central Africa and Southern Africa. Until the Scramble for Africa in the late 19th century, most of Africa was left uncolonized.For timelines of earlier events, see 15th century and Timeline of the Middle Ages.Main article: 1500sMona Lisa, by Leonardo da Vinci, c.15031506, one of the world's best-known paintings1501: Michelangelo returns to his native Florence to begin work on the statue David.1501: Safavid dynasty reunifies Iran and rules over it until 1736. Safavids adopt a Shia branch of Islam.[5]1501: First Battle of Cannanore between the Third Portuguese Armada and Kingdom of Cochin under Joo da Nova and Zamorin of Kozhikode's navy marks the beginning of Portuguese conflicts in the Indian Ocean.1502: First reported African slaves in the New World1502: The Crimean Khanate sacks Sarai in the Golden Horde, ending its existence.1503: Spain defeats France at the Battle of Cerignola. Considered to be the first battle in history won by gunpowder small arms.1503: Leonardo da Vinci begins painting the Mona Lisa and completes it three years later.1503: Nostradamus is born on either December 14 or December 21.1504: A period of drought, with famine in all of Spain.1504: Death of Isabella I of Castile; Joanna of Castile becomes the Queen.1504: Foundation of the Sultanate of Sennar by Amara Dunqas, in what is modern Sudan1505: Zhengde Emperor ascends the throne of Ming dynasty.1505: Martin Luther enters St. Augustine's Monastery at Erfurt, Germany, on 17 July and begins his journey to instigating the Reformation.1505: Sultan Trenggono builds the first Muslim kingdom in Java, called Demak, in Indonesia. Many other small kingdoms were established in other islands to fight against Portuguese. Each kingdom introduced local language as a way of communication and unity.1506: Leonardo da Vinci completes the Mona Lisa.1506: King Afonso I of Kongo wins the battle of Mbanza Kongo, resulting in Catholicism becoming Kongo's state religion.Battle of Cerignola: El Gran Capitan finds the corpse of Louis d'Armagnac, Duke of Nemours1506: At least two thousand converted Jews are massacred in a Lisbon riot, Portugal.1506: Christopher Columbus dies in Valladolid, Spain.1506: Poland is invaded by Tatars from the Crimean Khanate.1507: The first recorded epidemic of smallpox in the New World on the island of Hispaniola. It devastates the native Tano population.[6]1507: Afonso de Albuquerque conquered Hormuz and Muscat, among other bases in the Persian Gulf, taking control of the region at the entrance of the Gulf.1508: The Christian-Islamic power struggle in Europe and West Asia spills over into the Indian Ocean as Battle of Chaul during the Portuguese-Mamluk War15081512: Michelangelo paints the Sistine Chapel ceiling.1509: The defeat of joint fleet of the Sultan of Gujarat, the Mamlk Burji Sultanate of Egypt, and the Zamorin of Calicut with support of the Republic of Venice and the Ottoman Empire in Battle of Diu marks the beginning of Portuguese dominance of the Spice trade and the Indian Ocean.1509: The Portuguese king sends Diogo Lopes de Sequeira to find Malacca, the eastern terminus of Asian trade. After initially receiving Sequeira, Sultan Mahmud Shah captures and/or kills several of his men and attempts an assault on the four Portuguese ships, which escape.[7] The Javanese fleet is also destroyed in Malacca.1509: Krishnadevaraya ascends the throne of Vijayanagara Empire.Main article: 1510sAfonso de Albuquerque15091510: The 'great plague' in various parts of Tudor England.[8]1510: Afonso de Albuquerque of Portugal conquers Goa in India.1511: Afonso de Albuquerque of Portugal conquers Malacca, the capital of the Sultanate of Malacca in present-day Malaysia.1512: Copernicus writes Commentariolus, and proclaims the Sun the center of the Solar System.1512: The southern part (historical core) of the Kingdom of Navarre is invaded by Castile and Aragon.1512: Qutb Shahi dynasty, founded by Quli Qutb Mulk, rules Golconda Sultanate until 1687.1512: The first Portuguese exploratory expedition was sent eastward from Malacca (in present-day Malaysia) to search for the 'Spice Islands' (Maluku) led by Francisco Serro. Serro is shipwrecked but struggles on to Hitu (northern Ambon) and wins the favour of the local rulers.[9]1513: Machiavelli writes The Prince, a treatise about political philosophy1513: The Portuguese mariner Jorge lvares lands at Macau, China, during the Ming dynasty.1513: Henry VIII defeats the French at the Battle of the Spurs.1513: The Battle of Flodden Field in which invading Scots are defeated by Henry VIII's forces.1513: Sultan Selim I ("The Grim") orders the massacre of Shia Muslims in Anatolia (present-day Turkey).1513: Vasco Nez de Balboa, in service of Spain arrives at the Pacific Ocean (which he called Mar del Sur) across the Isthmus of Panama. He was the first European to do so.1514: The Battle of Orsha halts Muscovy's expansion into Eastern Europe.1514: Dzsa rebellion (peasant revolt) in Hungary.Martin Luther initiated the Reformation with his Ninety-five Theses in 1517.1514: The Battle of Chaldiran, the Ottoman Empire gains decisive victory against Safavid dynasty.1515: Ascension of Francis I of France as King of France following the death of Louis XII.1515: The Ottoman Empire wrests Eastern Anatolia from the Safavids after the Battle of Chaldiran.1515: The Ottomans conquer the last beyliks of Anatolia, the Dulkadirs and the Ramadanids.15161517: The Ottomans defeat the Mamluks and gain control of Egypt, Arabia, and the Levant.1517: The Sweating sickness epidemic in Tudor England.[10]1517: The Reformation begins when Martin Luther posts his Ninety-five Theses in Saxony.1518: The Treaty of London was a non-aggression pact between the major European nations. The signatories were Burgundy, France, England, the Holy Roman Empire, the Netherlands, the Papal States and Spain, all of whom agreed not to attack one another and to come to the aid of any that were under attack.1518: Mir Chakar Khan Rind leaves Baluchistan and settles in Punjab.1518: Leo Africanus, also known as al-Hasan ibn Muhammad al-Wazzan al-Fasi, an Andalusian Berber diplomat who is best known for his book Descrittione dellAfrica (Description of Africa), is captured by Spanish pirates; he is taken to Rome and presented to Pope Leo X.1518: The dancing plague of 1518 begins in Strasbourg, lasting for about one month.1519: Leonardo da Vinci dies of natural causes on May 2.Europe at the time of the accession of Charles V in 15191519: Wang Yangming, the Chinese philosopher and governor of Jiangxi province, describes his intent to use the firepower of the fo-lang-ji, a breech-loading Portuguese culverin, in order to suppress the rebellion of Prince Zhu Chenhao.1519: Barbary pirates led by Hayreddin Barbarossa, a Turk appointed to ruling position in Algiers by the Ottoman Empire, raid Provence and Toulon in southern France.1519: Death of Emperor Maximilian; Charles I of Austria, Spain, and the Low Countries becomes Emperor of Holy Roman Empire as Charles V, Holy Roman Emperor (ruled until 1556).15191522: Spanish expedition commanded by Magellan and Elcano are the first to Circumnavigate the Earth.15191521: Hernn Corts leads the Spanish conquest of the Aztec Empire.Main article: 1520sFerdinand Magellan led the first expedition that circumnavigated the globe in 15191522.15201566: The reign of Suleiman the Magnificent marks the zenith of the Ottoman Empire.1520: The first European diplomatic mission to Ethiopia, sent by the Portuguese, arrives at Massawa 9 April, and reaches the imperial encampment of Emperor Dawit II in Shewa 9 October.1520: Vijayanagara Empire forces under Krishnadevaraya defeat the Adil Shahi under at the Battle of Raichur1520: Sultan Ali Mughayat Shah of Aceh begins an expansionist campaign capturing Daya on the west Sumatran coast (in present-day Indonesia), and the pepper and gold producing lands on the east coast.1520: The Portuguese established a trading post in the village of Lamakera on the eastern side of Solor (in present-day Indonesia) as a transit harbour between Maluku and Malacca.1521: Belgrade (in present-day Serbia) is captured by the Ottoman Empire.1521: After building fortifications at Tuen Mun, the Portuguese attempt to invade Ming dynasty China, but are expelled by Chinese naval forces.1521: Philippines encountered by Ferdinand Magellan. He was later killed in the Battle of Mactan in central Philippines in the same year.1521: Jiajing Emperor ascended the throne of Ming dynasty, China.1521: November, Ferdinand Magellan's expedition reaches Maluku (in present-day Indonesia) and after trade with Ternate returns to Europe with a load of cloves.1521: Pati Unus leads the invasion of Malacca (in present-day Malaysia) against the Portuguese occupation. Pati Unus was killed in this battle, and was succeeded by his brother, sultan Trenggana.1522: Rhodes falls to the Ottomans of Suleiman the Magnificent.[11]Sack of Rome of 1527 by Charles V's forces (painting by Johannes Lingelbach)1522: The Portuguese ally themselves with the rulers of Ternate (in present-day Indonesia) and begin construction of a fort.[9]1522: August, Luso-Sundanese Treaty signed between Portugal and Sunda Kingdom granted Portuguese permit to build fortress in Sunda Kelapa.1523: Sweden gains independence from the Kalmar Union.1523: The Cacao bean is introduced to Spain by Hernn Corts15241525: German Peasants' War in the Holy Roman Empire.1524: Giovanni da Verrazzano is the first European to explore the Atlantic coast of North America between South Carolina and Newfoundland.1524: Ismail I, the founder of Safavid dynasty, dies and Tahmasp I becomes king.Gun-wielding Ottoman Janissaries and defending Knights of Saint John at the siege of Rhodes in 1522, from an Ottoman manuscript1525: Timurid Empire forces under Babur defeat the Lodi dynasty at the First Battle of Panipat, end of the Delhi Sultanate.1525: German and Spanish forces defeat France at the Battle of Pavia, Francis I of France is captured.1526: The Ottomans defeat the Kingdom of Hungary at the Battle of Mohcs.1526: Mughal Empire, founded by Babur.1527: Sack of Rome with Pope Clement VII escaping and the Swiss Guards defending the Vatican being killed. The sack of the city of Rome considered the end of the Italian Renaissance.1527: Protestant Reformation begins in Sweden.1527: The last ruler of Majapahit falls from power. This state (located in present-day Indonesia) was finally extinguished at the hands of the Demak. A large number of courtiers, artisans, priests, and members of the royalty moved east to the island of Bali; however, the power and the seat of government transferred to Demak under the leadership of Pangeran, later Sultan Fatah.1527: June 22, The Javanese Prince Fatahillah of the Cirebon Sultanate successfully defeated the Portuguese armed forces at the site of the Sunda Kelapa Harbor. The city was then renamed Jayakarta, meaning "a glorious victory." This eventful day came to be acknowledged as Jakarta's Founding Anniversary.1527: Mughal Empire forces defeat the Rajput led by Rana Sanga of Mewar at the Battle of Khanwa1529: The Austrians defeat the Ottoman Empire at the siege of Vienna.1529: Treaty of Zaragoza defined the antimeridian of Tordesillas attributing the Moluccas to Portugal and Philippines to Spain.1529: Imam Ahmad Gurey defeats the Ethiopian Emperor Dawit II in the Battle of Shimbra Kure, the opening clash of the EthiopianAdal War.Main article: 1530sSpanish conquistadors with their Tlaxcallan allies fighting against the Otomies of Metztitlan in present-day Mexico, a 16th-century codex15311532: The Church of England breaks away from the Catholic Church and recognizes King Henry VIII as the head of the Church.1531: The Inca Civil War is fought between the two brothers, Atahualpa and Huscar.1532: Francisco Pizarro leads the Spanish conquest of the Inca Empire.1532: Foundation of So Vicente, the first permanent Portuguese settlement in the Americas.1533: Anne Boleyn becomes Queen of England.1533: Elizabeth Tudor is born.1534: Jacques Cartier claims Canada for France.1534: The Ottomans capture Baghdad from the Safavids.1534: Affair of the Placards, where King Francis I becomes more active in repression of French Protestants.1535: The Mnster Rebellion, an attempt of radical, millennialist, Anabaptists to establish a theocracy, ends in bloodshed.1535: The Portuguese in Ternate depose Sultan Tabariji (or Tabarija) and send him to Portuguese Goa where he converts to Christianity and bequeaths his Portuguese godfather Jordao de Freitas the island of Ambon.[12] Hairun becomes the next sultan.1536: Catherine of Aragon dies in Kimbolton Castle, in England.Territorial expansion of the Ottoman Empire under Suleiman (in red and orange)1536: In England, Anne Boleyn is beheaded for adultery and treason.1536: Establishment of the Inquisition in Portugal.1536: Foundation of Buenos Aires (in present-day Argentina) by Pedro de Mendoza.1537: The Portuguese establish Recife in Pernambuco, north-east of Brazil.1537: William Tyndale's partial translation of the Bible into English is published, which would eventually be incorporated into the King James Bible.1538: Gonzalo Jimnez de Quesada founds Bogot.1538: SpanishVenetian fleet is defeated by the Ottoman Turks at the Battle of Preveza.1539: Hernando de Soto explores inland North America.Main article: 1540sNicolaus Copernicus1540: The Society of Jesus, or the Jesuits, is founded by Ignatius of Loyola and six companions with the approval of Pope Paul III.1540: Sher Shah Suri founds the Suri dynasty in South Asia, an ethnic Pashtun (Pathan) of the house of Sur, who supplanted the Mughal dynasty as rulers of North India during the reign of the relatively ineffectual second Mughal emperor Humayun. Sher Shah Suri decisively defeats Humayun in the Battle of Bilgram (May 17, 1540).1541: Pedro de Valdivia founds Santiago in Chile.1541: An Algerian military campaign by Charles V of Spain (Habsburg) is unsuccessful.1541: Amazon River is encountered and explored by Francisco de Orellana.1541: Capture of Buda and the absorption of the major part of Hungary by the Ottoman Empire.1541: Sahib I Giray of Crimea invades Russia.1542: The Italian War of 15421546 War resumes between Francis I of France and Emperor Charles V. This time Henry VIII is allied with the Emperor, while James V of Scotland and Sultan Suleiman I are allied with the French.1542: Akbar The Great is born in the Rajput Umarkot Fort1542: Spanish explorer Ruy Lpez de Villalobos named the island of Samar and Leyte Las Islas Filipinas honoring Philip II of Spain and became the official name of the archipelago.1543: Ethiopian/Portuguese troops defeat the Adal army led by Imam Ahmad Gurey at the Battle of Wayna Daga; Imam Ahmad Gurey is killed at this battle.1543: Copernicus publishes his theory that the Earth and the other planets revolve around the Sun1543: The Nanban trade period begins after Portuguese traders make contact with Japan.1544: The French defeat an ImperialSpanish army at the Battle of Ceresole.Scenes of everyday life in Ming China, by Qiu Ying1544: Battle of the Shirts in Scotland. The Frasers and Macdonalds of Clan Ranald fight over a disputed chiefship; reportedly, 5 Frasers and 8 Macdonalds survive.1545: Songhai forces sack the Malian capital of Niani1545: The Council of Trent meets for the first time in Trent (in northern Italy).1546: Michelangelo Buonarroti is made chief architect of St. Peter's Basilica.1546: Francis Xavier works among the peoples of Ambon, Ternate and Morotai (Moro) laying the foundations for a permanent mission. (to 1547)1547: Henry VIII dies in the Palace of Whitehall on 28 January at the age of 55.1547: Francis I dies in the Chteau de Rambouillet on 31 March at the age of 52.1547: Edward VI becomes King of England and Ireland on 28 January and is crowned on 20 February at the age of 9.1547: Emperor Charles V decisively dismantles the Schmalkaldic League at the Battle of Mhlberg.1547: Grand Prince Ivan the Terrible is crowned tsar of (All) Russia, thenceforth becoming the first Russian tsar.1548: Battle of Uedahara: Firearms are used for the first time on the battlefield in Japan, and Takeda Shingen is defeated by Murakami Yoshikiyo.1548: Askia Daoud, who reigned from 1548 to 1583, establishes public libraries in Timbuktu (in present-day Mali).1548: The Ming dynasty government of China issues a decree banning all foreign trade and closes down all seaports along the coast; these Hai jin laws came during the Wokou wars with Japanese pirates.1549: Tom de Sousa establishes Salvador in Bahia, north-east of Brazil.1549: Arya Penangsang with the support of his teacher, Sunan Kudus, avenges the death of Raden Kikin by sending an envoy named Rangkud to kill Sunan Prawoto by Keris Kyai Satan Kober (in present-day Indonesia).Main article: 1550sThe Islamic gunpowder empires: Mughal Army artillerymen during the reign of Jalaluddin Akbar1550: The architect Mimar Sinan builds the Sleymaniye Mosque in Istanbul.1550: Mongols led by Altan Khan invade China and besiege Beijing.15501551: Valladolid debate concerning the human rights of the Indigenous people of the Americas.1551: Fifth outbreak of sweating sickness in England. John Caius of Shrewsbury writes the first full contemporary account of the symptoms of the disease.1551: North African pirates enslave the entire population of the Maltese island Gozo, between 5,000 and 6,000, sending them to Libya.1552: Russia conquers the Khanate of Kazan in central Asia.1552: Jesuit China Mission, Francis Xavier dies.1553: Mary Tudor becomes the first queen regnant of England and restores the Church of England under Papal authority.1553: The Portuguese found a settlement at Macau.1554: Missionaries Jos de Anchieta and Manuel da Nbrega establishes So Paulo, southeast Brazil.1554: Princess Elizabeth is imprisoned in the Tower of London upon the orders of Mary I for suspicion of being involved in the Wyatt rebellion.1555: The Muscovy Company is the first major English joint stock trading company.1556: Publication in Venice of Delle Navigationi et Viaggi (terzo volume) by Giovanni Battista Ramusio, secretary of Council of Ten, with plan La Terra de Hochelaga, an illustration of the Hochelaga.[13]1556: The Shaanxi earthquake in China is history's deadliest known earthquake during the Ming dynasty.1556: Georgius Agricola, the "Father of Mineralogy", publishes his De re metallica.1556: Akbar defeats Hemu at the Second battle of Panipat.1556: Russia conquers the Astrakhan Khanate.15561605: During his reign, Akbar expands the Mughal Empire in a series of conquests (in the Indian subcontinent).Political map of the world in 15561556: Mir Chakar Khan Rind captures Delhi with Humayun.1556: Pomponio Algerio, radical theologian, is executed by boiling in oil as part of the Roman Inquisition.1557: Habsburg Spain declares bankruptcy. Philip II of Spain had to declare four state bankruptcies in 1557, 1560, 1575 and 1596.1557: The Portuguese settle in Macau (on the western side of the Pearl River Delta across from present-day Hong Kong).1557: The Ottomans capture Massawa, all but isolating Ethiopia from the rest of the world.1558: Elizabeth Tudor becomes Queen Elizabeth I at age 25.15581603: The Elizabethan era is considered the height of the English Renaissance.15581583: Livonian War between Poland, Grand Principality of Lithuania, Sweden, Denmark and Russia.1558: After 200 years, the Kingdom of England loses Calais to France.1559: With the Peace of Cateau Cambrsis, the Italian Wars conclude.1559: Sultan Hairun of Ternate (in present-day Indonesia) protests the Portuguese's Christianisation activities in his lands. Hostilities between Ternate and the Portuguese.Main article: 1560sThe Mughal Emperor Akbar shoots the Rajput warrior Jaimal during the Siege of Chittorgarh in 15671560: Ottoman navy defeats the Spanish fleet at the Battle of Djerba.1560: Elizabeth Bathory is born in Nyirbator, Hungary.1560: By winning the Battle of Okehazama, Oda Nobunaga becomes one of the pre-eminent warlords of Japan.1560: Jeanne d'Albret declares Calvinism the official religion of Navarre.1560: Lazarus Church, Macau1561: Sir Francis Bacon is born in London.1561: The fourth battle of Kawanakajima between the Uesugi and Takeda at Hachimanbara takes place.1561: Guido de Bres draws up the Belgic Confession of Protestant faith.1562: Mughal emperor Akbar reconciles the Muslim and Hindu factions by marrying into the powerful Rajput Hindu caste.15621598: French Wars of Religion between Catholics and Huguenots.1562: Massacre of Wassy and Battle of Dreux in the French Wars of Religion.1562: Portuguese Dominican priests build a palm-trunk fortress which Javanese Muslims burned down the following year. The fort was rebuilt from more durable materials and the Dominicans commenced the Christianisation of the local population.[12]1563: Plague outbreak claimed 80,000 people in Elizabethan England. In London alone, over 20,000 people died of the disease.1564: Galileo Galilei born on February 151564: William Shakespeare baptized 26 April1565: Deccan sultanates defeat the Vijayanagara Empire at the Battle of Talikota.1565: Mir Chakar Khan Rind dies at aged 97.1565: Estcio de S establishes Rio de Janeiro in Brazil.1565: The Hospitallers, a Crusading Order, defeat the Ottoman Empire at the siege of Malta (1565).1565: Miguel Lpez de Legazpi establishes in Cebu the first Spanish settlement in the Philippines starting a period of Spanish colonization that would last over three hundred years.1565: Spanish navigator Andres de Urdaneta discovers the maritime route from Asia to the Americas across the Pacific Ocean, also known as the tornaviaje.1565: Royal Exchange is founded by Thomas Gresham.1566: Suleiman the Magnificent, ruler of the Ottoman Empire, dies on September 7, during the battle of Szigetvar.Siege of Valenciennes during the Dutch War of Independence in 156715661648: Eighty Years' War between Spain and the Netherlands.1566: Da le Balle Contrade d'Oriente, composed by Cipriano de Rore.1567: After 45 years' reign, Jiajing Emperor died in the Forbidden City, Longqing Emperor ascended the throne of Ming dynasty.1567: Mary, Queen of Scots, is imprisoned by Elizabeth I.1568: The Transylvanian Diet, under the patronage of the prince John Sigismund Zpolya, the former king of Hungary, inspired by the teachings of Ferenc Dvid, the founder of the Unitarian Church of Transylvania, promulgates the Edict of Torda, the first law of freedom of religion and of conscience in the World.15681571: Morisco Revolt in Spain.15681600: The Azuchi-Momoyama period in Japan.1568: Hadiwijaya sent his adopted son and son in-law Sutawijaya, who would later become the first ruler of the Mataram dynasty of Indonesia, to kill Arya Penangsang.1569: Rising of the North in England.1569: Mercator 1569 world map published by Gerardus Mercator.1569: The PolishLithuanian Commonwealth is created with the Union of Lublin which lasts until 1795.1569: Peace treaty signed by Sultan Hairun of Ternate and Governor Lopez De Mesquita of Portugal.Main article: 1570sThe Battle of Lepanto1570: Ivan the Terrible, tsar of Russia, orders the massacre of inhabitants of Novgorod.1570: Pope Pius V issues Regnans in Excelsis, a papal bull excommunicating all who obeyed Elizabeth I and calling on all Catholics to rebel against her.1570: Sultan Hairun of Ternate (in present-day Indonesia) is killed by the Portuguese.[12] Babullah becomes the next Sultan.1570: 20,000 inhabitants of Nicosia in Cyprus were massacred and every church, public building, and palace was looted. Cyprus fell to the Ottoman Turks the following year.1571: Pope Pius V completes the Holy League as a united front against the Ottoman Turks, responding to the fall of Cyprus to the Ottomans.1571: The Spanish-led Holy League navy destroys the Ottoman Empire navy at the Battle of Lepanto.1571: Crimean Tatars attack and sack Moscow, burning everything but the Kremlin.1571: American Indians kill Spanish missionaries in what would later be Jamestown, Virginia.1571: Spanish conquistador Miguel Lpez de Legazpi establishes Manila, Philippines as the capital of the Spanish East Indies.1572: Brielle is taken from Habsburg Spain by Protestant Watergeuzen in the Capture of Brielle, in the Eighty Years' War.1572: Spanish conquistadores apprehend the last Inca leader Tupak Amaru at Vilcabamba, Peru, and execute him in Cuzco.1572: Jeanne d'Albret dies aged 43 and is succeeded by Henry of Navarre.1572: Catherine de' Medici instigates the St. Bartholomew's Day massacre which takes the lives of Protestant leader Gaspard de Coligny and thousands of Huguenots. The violence spreads from Paris to other cities and the countryside.1572: First edition of the epic The Lusiads of Lus Vaz de Cames, three years after the author returned from the East.[14]1572: The 9 years old Taizi, Zhu Yijun ascended the throne of Ming dynasty, known as Wanli Emperor.1573: After heavy losses on both sides the siege of Haarlem ends in a Spanish victory.St. Bartholomew's Day massacre of French Protestants1574: in the Eighty Years' War the capital of Zeeland, Middelburg declares for the Protestants.1574: After a siege of 4 months the siege of Leiden ends in a comprehensive Dutch rebel victory.1575: Oda Nobunaga finally captures Nagashima fortress.1575: Following a five-year war, the Ternateans under Sultan Babullah defeated the Portuguese.1576: Tahmasp I, Safavid shah, dies.1576: The Battle of Haldighati is fought between the ruler of Mewar, Maharana Pratap and the Mughal Empire's forces under Emperor Akbar led by Raja Man Singh.1576: Sack of Antwerp by badly paid Spanish soldiers.15771580: Francis Drake circles the world.1577: Ki Ageng Pemanahan built his palace in Pasargede or Kotagede.1578: King Sebastian of Portugal is killed at the Battle of Alcazarquivir.1578: The Portuguese establish a fort on Tidore but the main centre for Portuguese activities in Maluku becomes Ambon.[12]1578: Sonam Gyatso is conferred the title of Dalai Lama by Tumed Mongol ruler, Altan Khan. Recognised as the reincarnation of two previous Lamas, Sonam Gyatso becomes the third Dalai Lama in the lineage.[15]1578: Governor-General Francisco de Sande officially declared war against Brunei in 1578, starting the Castilian War of 1578.1579: The Union of Utrecht unifies the northern Netherlands, a foundation for the later Dutch Republic.1579: The Union of Arras unifies the southern Netherlands, a foundation for the later states of the Spanish Netherlands, the Austrian Netherlands and Belgium.The Irish Gaelic chieftain's feast, from The Image of Ireland1579: The British navigator Sir Francis Drake passes through Maluku and transit in Ternate on his circumnavigation of the world. The Portuguese establish a fort on Tidore but the main centre for Portuguese activities in Maluku becomes Ambon.[16]Main article: 1580sThe fall of Spanish Armada1580: Drake's royal reception after his attacks on Spanish possessions influences Philip II of Spain to build up the Spanish Armada. English ships in Spanish harbours are impounded.1580: Spain unifies with Portugal under Philip II. The struggle for the throne of Portugal ends the Portuguese Empire. The Spanish and Portuguese crowns are united for 60 years, i.e. until 1640.15801587: Nagasaki comes under control of the Jesuits.1581: Dutch Act of Abjuration, declaring abjuring allegiance to Philip II of Spain.1581: Bayinnaung dies at the age of 65.1582: Oda Nobunaga commits seppuku during the Honn-ji Incident coup by his general, Akechi Mitsuhide.1582: Pope Gregory XIII issues the Gregorian calendar. The last day of the Julian calendar was Thursday, 4 October 1582 and this was followed by the first day of the Gregorian calendar, Friday, 15 October 15821582: Yermak Timofeyevich conquers the Siberia Khanate on behalf of the Stroganovs.1583: Denmark builds the world's first theme park, Bakken.1583: Death of Sultan Babullah of Ternate.15841585: After the siege of Antwerp, many of its merchants flee to Amsterdam. According to Luc-Normand Tellier, "At its peak, between 1510 and 1557, Antwerp concentrated about 40% of the world trade...It is estimated that the port of Antwerp was earning the Spanish crown seven times more revenues than the Americas."[17]1584: Ki Ageng Pemanahan died. Sultan Pajang raised Sutawijaya, son of Ki Ageng Pemanahan as the new ruler in Mataram, titled "Loring Ngabehi Market" (because of his home in the north of the market).1585: Akbar annexes Kashmir and adds it to the Kabul SubahPortuguese fusta in India from a book by Jan Huygen van Linschoten1585: Colony at Roanoke founded in North America.15851604: The Anglo-Spanish War is fought on both sides of the Atlantic.1587: Mary, Queen of Scots is executed by Elizabeth I.1587: The reign of Abbas I marks the zenith of the Safavid dynasty.1587: Troops that would invade Pajang Mataram Sultanate storm ravaged the eruption of Mount Merapi. Sutawijaya and his men survived.1588: Mataram into the kingdom with Sutawijaya as Sultan, titled "Senapati Ingalaga Sayidin Panatagama" means the warlord and cleric Manager Religious Life.1588: England repulses the Spanish Armada.1589: Spain repulses the English Armada.1589: Catherine de' Medici dies at aged 69.Main articles: 1590s and 1600sAbu'l-Fazl ibn Mubarak presenting Akbarnama to Mughal Azam Akbar, Mughal miniature1590: Siege of Odawara: the Go-Hojo clan surrender to Toyotomi Hideyoshi, and Japan is unified.1591: Gazi Giray leads a huge Tatar expedition against Moscow.1591: In Mali, Moroccan forces of the Sultan Ahmad al-Mansur led by Judar Pasha defeat the Songhai Empire at the Battle of Tondibi.15921593: John Stow reports 10,675 plague deaths in London, a city of approximately 200,000 people.15921598: Korea, with the help of Ming dynasty China, repels two Japanese invasions.15931606: The Long War between the Habsburg monarchy and the Ottoman Turks.1594: St. Paul's College, Macau, founded by Alessandro Valignano.1595: First Dutch expedition to Indonesia sets sail for the East Indies with two hundred and forty-nine men and sixty-four cannons led by Cornelis de Houtman.[18]1596: Birth of Ren Descartes.1596: June, de Houtman's expedition reaches Banten the main pepper port of West Java where they clash with both the Portuguese and Indonesians. It then sails east along the north coast of Java losing twelve crew to a Javanese attack at Sidayu and killing a local ruler in Madura.[18]1597: Romeo and Juliet is published.1597: Cornelis de Houtman's expedition returns to the Netherlands with enough spices to make a considerable profit.[18]1598: The Edict of Nantes ends the French Wars of Religion.1598: Abbas I moves Safavids capital from Qazvin to Isfahan in 1598.15981613: Russia descends into anarchy during the Time of Troubles.1598: The Portuguese require an armada of 90 ships to put down a Solorese uprising.[12] (to 1599)1598: More Dutch fleets leave for Indonesia and most are profitable.[18]Edo period screen depicting the Battle of Sekigahara1598: The province of Santa Fe de Nuevo Mxico is established in Northern New Spain. The region would later become a territory of Mexico, the New Mexico Territory in the United States, and the US State of New Mexico.1598: Death of Toyotomi Hideyoshi, known as the unifier of Japan.1599: The Mali Empire is defeated at the Battle of Jenn.1599: The van Neck expedition returns to Europe. The expedition makes a 400 per cent profit.[18] (to 1600)1599: March, Leaving Europe the previous year, a fleet of eight ships under Jacob van Neck was the first Dutch fleet to reach the Spice Islands of Maluku.[18]1600: Giordano Bruno is burned at the stake for heresy in Rome.Siege of Fiakovo castle during the Long Turkish War1600: Battle of Sekigahara in Japan. End of the Warring States period and beginning of the Edo period.1600: The Portuguese win a major naval battle in the bay of Ambon.[19] Later in the year, the Dutch join forces with the local Hituese in an anti-Portuguese alliance, in return for which the Dutch would have the sole right to purchase spices from Hitu.[19]1600: Elizabeth I grants a charter to the British East India Company beginning the English advance in Asia.1600: Michael the Brave unifies the three principalities: Wallachia, Moldavia and Transylvania after the Battle of elimbr from 1599.For later events, see Timeline of the 17th century.Polybius' The Histories translated into Italian, English, German and French.[20]Mississippian culture disappears.Medallion rug, variant Star Ushak style, Anatolia (modern Turkey), is made. It is now kept at the Saint Louis Art Museum.Hernan Cortes (14851547)Henry VIII, (14911547) King of England and IrelandDon Fernando lvarez de Toledo (15071582)Suleiman the Magnificent, Sultan of the Ottoman Empire (15201566)Ivan IV the Terrible (15301584)Oda Nobunaga (15341582)Sir Francis Drake (c. 1540 1596)Alberico Gentili, (15521608) the Father of international lawPhilip II of Spain, King of Spain (15561598)Akbar the Great, Mughal emperor (15561605)Related article: List of 16th century inventions.The Columbian Exchange introduces many plants, animals and diseases to the Old and New Worlds.Introduction of the spinning wheel revolutionizes textile production in Europe.The letter J is introduced into the English alphabet.1500: First portable watch is created by Peter Henlein of Germany.The Iberian Union in 1598, under Philip II, King of Spain and Portugal1513: Juan Ponce de Len sights Florida and Vasco Nez de Balboa sights the eastern edge of the Pacific Ocean.15191522: Ferdinand Magellan and Juan Sebastin Elcano lead the first circumnavigation of the world.15191540: In America, Hernando de Soto expeditions map the Gulf of Mexico coastline and bays.1525: Modern square root symbol ()1540: Francisco Vsquez de Coronado sights the Grand Canyon.154142: Francisco de Orellana sails the length of the Amazon River.154243: Firearms are introduced into Japan by the Portuguese.1543: Copernicus publishes his theory that the Earth and the other planets revolve around the Sun1545: Theory of complex numbers is first developed by Gerolamo Cardano of Italy.1558: Camera obscura is first used in Europe by Giambattista della Porta of Italy.15591562: Spanish settlements in Alabama/Florida and Georgia confirm dangers of hurricanes and local native warring tribes.1565: Spanish settlers outside New Spain (Mexico) colonize Florida's coastline at St. Augustine.1565: Invention of the graphite pencil (in a wooden holder) by Conrad Gesner. Modernized in 1812.1568: Gerardus Mercator creates the first Mercator projection map.1572: Supernova SN 1572 is observed by Tycho Brahe in the Milky Way.1582: Gregorian calendar is introduced in Europe by Pope Gregory XIII and adopted by Catholic countries.c. 1583: Galileo Galilei of Pisa, Italy identifies the constant swing of a pendulum, leading to development of reliable timekeepers.1585: earliest known reference to the 'sailing carriage' in China.1589: William Lee invents the stocking frame.1591: First flush toilet is introduced by Sir John Harrington of England, the design published under the title 'The Metamorphosis of Ajax'.1593: Galileo Galilei invents a thermometer.1596: William Barents discovers Spitsbergen.1597: Opera in Florence by Jacopo Peri.Entertainment in the 16th century^ a b Modern reference works on the period tend to follow the introduction of the Gregorian calendar for the sake of clarity; thus NASA's lunar eclipse catalogue states "The Gregorian calendar is used for all dates from 1582 Oct 15 onwards. Before that date, the Julian calendar is used." For dates after 15 October 1582, care must be taken to avoid confusion of the two styles.^ de Vries, Jan (14 September 2009). "The limits of globalization in the early modern world". The Economic History Review. 63 (3): 710733. CiteSeerX10.1.1.186.2862. doi:10.1111/j.1468-0289.2009.00497.x. JSTOR40929823. S2CID219969360. SSRN1635517.^ Singh, Sarina; Lindsay Brown; Paul Clammer; Rodney Cocks; John Mock (2008). Pakistan & the Karakoram Highway. Vol.7, illustrated. Lonely Planet. p.137. ISBN978-1-74104-542-0. Retrieved 23 August 2010.^ Babur (2006). Babur Nama. Penguin Books. p.vii. ISBN978-0-14-400149-1.^ "16th Century Timeline (1501 to 1600)". fsmitha.com. Archived from the original on February 3, 2009.^ "History of Smallpox Smallpox Through the Ages" Archived 2019-09-24 at the Wayback Machine. Texas Department of State Health Services.^ Ricklefs (1991), p.23^ "A LIST OF NATIONAL EPIDEMICS OF PLAGUE IN ENGLAND 13481665". Archived from the original on 2009-05-08. Retrieved 2009-04-25.^ a b Ricklefs (1991), page 24^ The Sweating Sickness. Story of London.. Accessed 2009-04-25. Archived 2009-05-03.^ Sandra Arlinghaus. "Life Span of Suleiman the Magnificent 14941566". Personal.umich.edu. Retrieved 2013-05-05.^ a b c d e Ricklefs (1991), page 25^ "La Terra De Hochelaga Jaques Cartier a Hochelaga". jacquescartier.org. Archived from the original on December 23, 2008.^ "The Lusiads". World Digital Library. 18001882. Retrieved 2013-08-31.^ Schwieger, Peter (2014). The Dalai Lama and the Emperor of China: a political history of the Tibetan institution of reincarnation. New York: Columbia University Press. ISBN9780231538602. OCLC905914446.^ Miller, George, ed. (1996). To The Spice Islands and Beyond: Travels in Eastern Indonesia. New York: Oxford University Press. pp.xv. ISBN967-65-3099-9.^ Luc-Normand Tellier (2009). "Urban world history: an economic and geographical perspective". PUQ. p.308. ISBN2-7605-1588-5^ a b c d e f Ricklefs (1991), page 27^ a b Ricklefs (1991), page 28^ Polybius: The Rise Of The Roman Empire, Page 36, Penguin, 1979.Langer, William. An Encyclopedia of World History (5th ed. 1973); highly detailed outline of events online free Media related to 16th century at Wikimedia CommonsTimelines of 16th century events, science, culture and personsRetrieved from " 4The following pages link to 16th century External tools(link counttransclusion countsorted list) See help page for transcluding these entriesShowing 50 items.View (previous 50 | next 50) (20 | 50 | 100 | 250 | 500)Bagpipes (links | edit)List of decades, centuries, and millennia (links | edit)Fashion (links | edit)Giovanni Boccaccio (links | edit)History of Mali (links | edit)History of Mauritius (links | edit)Post office (links | edit)Snare drum (links | edit)Republican Party (United States) (links | edit)20th century (links | edit)15th century (links | edit)17th century (links | edit)18th century (links | edit)1624 (links | edit)1626 (links | edit)1642 (links | edit)1661 (links | edit)1608 (links | edit)1492 (links | edit)14th century (links | edit)1st century (links | edit)13th century (links | edit)4th century (links | edit)12th century (links | edit)11th century (links | edit)1564 (links | edit)1648 (links | edit)1572 (links | edit)1623 (links | edit)1662 (links | edit)1490s (links | edit)1640s (links | edit)1597 (links | edit)1690 (links | edit)1688 (links | edit)7th century (links | edit)10th century (links | edit)9th century (links | edit)8th century (links | edit)6th century (links | edit)5th century (links | edit)3rd century (links | edit)2nd century (links | edit)1573 (links | edit)1570s (links | edit)1574 (links | edit)1436 (links | edit)1476 (links | edit)1542 (links | edit)1540s (links | edit)View (previous 50 | next 50) (20 | 50 | 100 | 250 | 500)Retrieved from " WhatLinksHere/16th_century" HomeElectrical Molded Case Circuit Breaker (MCCB): Types, Working, and Applications Explained Magnetic Starter : Circuit, Working, Wiring, Vs Contactor, Advantages & Its Applications Preamplifier : Circuit, Working, Types, Differences, How to Choose, & Its Applications 2 Point Starter : Circuit, Working, Differences & Its Applications Plug Flow Reactor : Working, Derivation, Characteristics & Its Applications Electric Boiler : Working, Types, Differences, Maintenance & Its Applications Electronics Logic Analyzer : Block Diagram, Working, Types, Differences, Maintenance & Its Applications ESP32 S2 Development Board : PinOut, Features, Specifications, Components, Interfacing, Datasheet & Its Applications ESP8266 Web Server : Working, Modes, Specifications, Interfacing, Example, Libraires & Its Applications ADXL335 Accelerometer Sensor : PinOut, Specifications, Components, Working, Interfacing, Datasheet & Its Applications Future Trends in Drone Technology ESP32 S3 Development Board : PinOut, Features, Specifications, Interfacing, Datasheet & Its Applications Communication Loop Antenna : Design, Working, Types, Radiation Pattern & Its Applications Corner Reflector : Working, Types, Calculation, radiation pattern & Its Applications Space Division Multiplexing : Diagram, Working, Advantages, Disadvantages & Its Applications Microstrip Antenna : Construction, Working, Types, Feeding Methods & Its Applications Alphanumeric Code : Types, Advantages & Its Applications Short Dipole Antenna : Design, Working, Radiation Pattern, Effectiveness & Its Applications RoboticsProjectsGeneral Manual Transmission in Formula 1 & Racing Cars Analyzing various digital signals simultaneously has become essential in digital technology to identify... The ESP32-S2 is a highly capable microcontroller from the ESP32 family, developed by Espressif with key... A circuit breaker is an electrical switch that protects the circuit or load... A motor starter is an electrical device used to control an electric motor in... The preamplifier or preamp was first invented in the early 20th century as a... A starter is a protection device used to protect the electric motor from overload... Plug flow is a significant characteristic of these reactors, so any two molecules... EleDay by day the usage of electrical boilers is rising due to its popularity... A DC machine is an electromechanical device, used to change DC electricity into... There are different types of materials & also substances that are made up... Arduino UNO is a Microcontroller developed using ATmega328P. It has 14 digital I/O pins. From among these 14 pins, 6 are used... Nowadays, Image processing is normally used by a wide range of applications and in different types of electronics like computers,... The main aim of this proposed project is to design and implement a flexible, cost-effective and powerful GSM Based Industrial... To know more about ATmega16 first, we need to know some history about the microcontroller. Actually what it is? Well as we human... The Arduino Uno is one kind of microcontroller board based on ATmega328, and Uno is an Italian term which means one. Arduino Uno... Robots are automatically operated machines that are developed for multiple purposes. Robotics includes welding, assembly, monitoring, rescue & recovery and lot more....

may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use. ShareAlike If you remix, transform, or build upon the material, you must distribute your contributions under the same license as the original. No additional restrictions You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits. You do not have to comply with the license for elements of the material in the public domain or where your use is permitted by an applicable exception or limitation . No warranties are given. The license may not give you all of the permissions necessary for your intended use. For example, other rights such as publicity, privacy, or moral rights may limit how you use the material. The gear pumps essential as well as most frequently used pumps. As the name suggests, these pumps are inbuilt with gears. The main function of these gears is to provide force energy to the water within the pumps. In simple terms, the function of this pump is to transfer the water from one location to another location with the help of gear instrument. If the systems force remains similar then theyll supply you the fixed flow speed. This article discusses an overview of Gear-Pumps. So let us discuss an overview of these pumps with types, working, advantages, disadvantages and their applications.What is a Gear Pump?The gear pump definition is, it is a PD (positive displacement) rotating pump which assists you to move water otherwise fluid with the help of inbuilt gears. This type of pump includes two or more gears that create vacuum force to drive the liquid within the pump. This pump can be built with different parts like shaft, rotors, and casing.Gear PumpThese pumps have high-pressure and are available in tiny sizes to supply constant liquid flow & a pulseless as contrasted to other types of pumps such as diaphragm & peristaltic pumps. The main benefits of using these pumps are superior like it can drive high thickness fluids, easy to use, operate and also maintain.How does it Work?The gear pump working principle is, it uses the gears actions otherwise rotating actions to move liquids. The rotating part extends the seal of liquid by the pump case to create suction at the inlet of the pump. Liquid drawn into the pump can be included in the rotating gears cavities and moved to the expulsion.Types of Gear PumpsThese pumps are classified into different types but some of the basic gear pump designs are classified into two types which include the following.External Gear PumpInternal Gear Pump1). External Gear PumpAn external gear-pump can be built with two gears namely interlocking and identical where interlocking gear is held up with separate shafts. In general, single gear can be driven with the help of a motor to drive the other gear. In a few cases, shafts can be driven by electrical motors, and these are held with bearings on every casing side.When the gears appear from the mesh on the pumps inlet side, they make an extended quantity. Fluid supplies into the cavities as well as trapped with the teeth of gear because the gears continue for rotating next to the casing of the pump. The trapped liquid can be moved from the inlet side to the discharge side in the region of the casing.When the gears teeth become linked on the discharge surface of the gear-pump, then the amount can be decreased & the liquid is forced out beneath force. No liquid can be moved back throughout the center, among the gears, since they are linked. Close tolerances among the gears as well as the covering let the pump to expand suction on the inlet & stop liquid from leaking reverse from the expulsion side. The designs of these pumps can use helical, spur, otherwise herringbone gears.Features of External Gear PumpThe features of this pump include the followingThese pumps are solid in size with a simple designThese are sufficient to distribute high capacities because of their huge outlets.It manages the pressures like low, medium otherwise highThe shaft support as well as close tolerance on both surfaces of gears.2). Internal Gear PumpAn internal gear pump works on a similar principle except the two linking gears sizes are different with one revolving within the other. The rotor is a larger gear and also an inner gear, and it has the teeth projecting inside. A minor external gear is mounted, and this is mainly designed for linking by the rotor so that the teeth of the gear connected at a single end. A bushing and pinion can be connected to the pump case that holds the idler within the location.A permanent semi-circular formed divider otherwise spacer seals the void shaped through the off-center mounting location of the idler & performs like a seal among the ports like inlet & outlet. When the gears appear from the mesh on the pumps inlet side, they make an extended quantity. Fluid supplies into the cavities as well as trapped with the teeth of gear because the gears continue for rotating next to the casing of the pump. The trapped liquid can be moved from the inlet side to the discharge side in the region of the casing.When the gears teeth become linked on the discharge surface of the pump, then the amount can be decreased & the liquid is forced out beneath force. Inner gear pump plans only utilize spur gears.Features of Internal Gear PumpsThe features of internal gear pumps include the followingIt can be run for a small phase.It has a huge and big footprint.The net positive suction head (NPSH) requirement is very low.Advantages and Disadvantages of Gear PumpsThe advantages of these pumps include the following.Maintenance is simpleIt handles an extensive range of viscositiesOutput is controllableEasy to reconstructCavitations are less sensitiveThe disadvantages of these pumps include the following.The liquid should be free of abrasivesInterlocking gears can also be loudApplications of Gear PumpsThe gear pumps applications include the following.These pumps are usually used for driving high thickness fluids like oil, resins, paints, otherwise foodstuffs.These pumps are chosen where a high force o/p is necessary. These pipes are preferred in any condition whereverthe supply is unequal. Because the pump output is not really influenced by force.Both the internal and external pumps are commonly used in different fuel, lube oils, solvents and alcoholsThe external pumps are used in chemical preservative, polymer metering, mixing and blending of chemical, agriculture, industrial, and mobile hydraulic applications.Thus, this is all aboutthe gear pump, this pump can be used to move a liquid with frequently surrounded a permanent volume in linking cogs otherwise gears, moving it automatically to push a flat pulse-free flow relative to the rotating velocity of its gears. Here, is a question for you, what are the main features of a gear pump? Agear pump is a type of positive displacement (PD) pump. Gear pumps use the actions of rotating cogs or gears to transfer fluids. The rotating gears develop a liquid seal with the pump casing and create a vacuum at the pump inlet. Fluid, drawn into the pump, is enclosed within the cavities of the rotating gears and transferred to the discharge. A gear pump delivers a smooth pulse-free flow proportional to the rotational speed of its gears. There are two basic designs of gear pump: internal and external (Figure 1). An internal gear pump has two interlocking gears of different sizes with one rotating inside the other. An external gear pump consists of two identical, interlocking gears supported by separate shafts. Generally, one gear is driven by a motor and this drives the other gear (the idler). In some cases, both shafts may be driven by motors. The shafts are supported by bearings on each side of the casing. This article describes external gear pumps in more detail. How does an external gear pump work? There are three stages in an internal gear pumps working cycle: filling, transfer and delivery (Figure 2). As the gears come out of mesh on the inlet side of the pump, they create an expanded volume. Liquid flows into the cavities and is trapped by the gear teeth as the gears continue to rotate against the pump casing. The trapped fluid is moved from the inlet, to the discharge, around the casing. As the teeth of the gears become interlocked on the discharge side of the pump, the volume is reduced and the fluid is forced out under pressure. No fluid is transferred back through the centre, between the gears, because they are interlocked. Close tolerances between the gears and the casing allow the pump to develop suction at the inlet and prevent fluid from leaking back from the discharge side (although leakage is more likely with low viscosity liquids). External gear pump designs can utilise spur, helical or herringbone gears (Figure 3). A helical gear design can reduce pump noise and vibration because the teeth engage and disengage gradually throughout the rotation. However, it is important to balance axial forces resulting from the helical gear teeth and this can be achieved by mounting two sets of mirrored helical gears together or by using a v-shaped, herringbone pattern. With this design, the axial forces produced by each half of the gear cancel out. Spur gears have the advantage that they can be run at very high speed and are easier to manufacture. What are the main features and benefits of an external gear pump? Gear pumps are compact and simple with a limited number of moving parts. They are unable to match the pressure generated by reciprocating pumps or the flow rates of centrifugal pumps but offer higher pressures and throughputs than vane or lobe pumps. External gear pumps are particularly suited for pumping water, polymers, fuels and chemical additives. Small external gear pumps usually operate at up to 3500 rpm and larger models, with helical or herringbone gears, can operate at speeds up to 700 rpm. External gear pumps have close tolerances and shaft support on both sides of the gears. This allows them to run at up to 7250 psi (500 bar), making them well suited for use in hydraulic power applications. Since output is directly proportional to speed and is a smooth pulse-free flow, external gear pumps are commonly used for metering and blending operations as the metering is continuous and the output is easy to monitor. The low internal volume provides for a reliable measure of liquid passing through a pump and hence accurate flow control. They are also used extensively in engines and gearboxes to circulate lubrication oil. External gear pumps can also be used in hydraulic power applications, typically in vehicles, lifting machinery and mobile plant equipment. Driving a gear pump in reverse, using oil pumped from elsewhere in a system (normally by a tandem pump in the engine), creates a motor. This is particularly useful to provide power in areas where electrical equipment is bulky, costly or inconvenient. Tractors, for example, rely on engine-driven external gear pumps to power their services. External gear pumps can be engineered to handle aggressive liquids. While they are commonly made from cast iron or stainless steel, new alloys and composites allow the pumps to handle corrosive liquids such as sulphuric acid, sodium hypochlorite, ferric chloride and sodium hydroxide. What are the limitations of a gear pump? External gear pumps are self-priming and can dry-lift although their priming characteristics improve if the gears are wetted. The gears need to be lubricated by the pumped fluid and should not be run dry for prolonged periods. Some gear pump designs can be run in either direction so the same pump can be used to load and unload a vessel, for example. The close tolerances between the gears and casing mean that these types of pump are susceptible to wear particularly when used with abrasive fluids or feeds containing entrained solids. External gear pumps have four bearings in the pumped medium, and tight tolerances, so are less suited to handling abrasive fluids. For these applications, internal gear pumps are more robust having only one bearing (sometimes two) running in the fluid. A gear pump should always have a strainer installed on the suction side to protect it from large, potentially damaging, solids. Generally, if the pump is expected to handle abrasive solids it is advisable to select a pump with a higher capacity so it can be operated at lower speeds to reduce wear. However, it should be borne in mind that the volumetric efficiency of a gear pump is reduced at lower speeds and flow rates. A gear pump should not be operated too far from its recommended speed. For high temperature applications, it is important to ensure that the operating temperature range is compatible with the pump specification. Thermal expansion of the casing and gears reduces clearances within a pump and this can also lead to increased wear, and in extreme cases, pump failure. Despite the best precautions, gear pumps generally succumb to wear of the gears, casing and bearings over time. As clearances increase, there is a gradual reduction in efficiency and increase in flow slip: leakage of the pumped fluid from the discharge back to the suction side. Flow slip is proportional to the cube of the clearances between the cog teeth and casing so, in practice, wear has a small effect until a critical point is reached, from which performance degrades rapidly. Gear pumps continue to pump against a back pressure and, if subjected to a downstream blockage will continue to pressurise the system until the pump, pipework or other equipment fails. Although most gear pumps are equipped with relief valves for this reason, it is always advisable to fit relief valves elsewhere in the system to protect downstream equipment. The high speeds and tight clearances of external gear pumps make them unsuitable for shear-sensitive liquids such as foodstuffs, paint and soaps. Internal gear pumps, operating at lower speed, are generally preferred for these applications. What are the main applications for gear pumps? External gear pumps are commonly used for pumping water, light oils, chemical additives, resins or solvents. They are preferred in any application where accurate dosing is required such as fuels, polymers or chemical additives. The output of a gear pump is not greatly affected by pressure so they also tend to be preferred in any situation where the supply is irregular. Some typical applications of external gear pumps are: Water Various fuel oils and lube oils (engine and gear box lubrication systems) Chemical additive and polymer metering Chemical mixing and blending Industrial, agricultural and mobile hydraulic applications (tractors, log splitters, lifts, etc.) Acids and caustic (with stainless steel or composite construction) Resins and polymers Alcohols and solvents Summary An external gear pump moves a fluid by repeatedly enclosing a fixed volume within interlocking gears, transferring it mechanically to deliver a smooth pulse-free flow proportional to the rotational speed of its gears. External gear pumps are commonly used for pumping water, light oils, chemical additives, resins or solvents. They are preferred in applications where accurate dosing or high pressure output is required. External gear pumps are capable of sustaining high pressures. The tight tolerances, multiple bearings and high speed operation make them less suited to high viscosity fluids or any abrasive medium or feed with entrained solids. Michael Smith Engineers Limited was formed in 1971 as a specialist pump distributor to the chemical, processing and manufacturing industries in the United Kingdom and Ireland. We currently offer ranges of conventionally sealed and magnetically driven internal gear pumps, external gear pumps and centrifugal pumps (including metal centrifugal pumps, plastic centrifugal pumps and lined centrifugal pumps), high pressure diaphragm pumps, rotary piston pumps, side-channel pumps, vane pumps, air operated double diaphragm pumps, drum pumps and barrel emptying pumps. We also offer ranges of hygienic circumferential piston pumps, hygienic rotary lobe pumps, hygienic centrifugal pumps, hygienic side-channel pumps, hygienic peripheral pumps, and hygienic twin screw pumps. Our principals include Finish Thompson (1978), Micropump (1980), Liquiflo (1987), Dickow (2000), HNPM (2006), Viking (2007), Wanner Hydra-Cell (2007), SAWA (2024), Viking Pump Hygienic (2024) and Bornemann (2024) We have extensiveexperience of pumping many hard to handle liquids including acids, bases, organic liquids, solvents, inorganic liquids, slurries, volatile liquids, corrosives, abrasive liquids, non-lubricating liquids, liquids with entrained gases and flammable liquids. Please contact us to help you select the right pump for your difficult liquid pumping application. Not sure which pump? Ask our specialists Coils for Solenoid and Proportional Valves16Pages

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