Jan. 7, 1969 H. DECKER 3,420,350

TYPE HEAD DRIVING MEANS EMPLOYING FLEXIBLE BELT

Filed Aug. 30, 1967 Sheet 1 of 4

FIG. 1

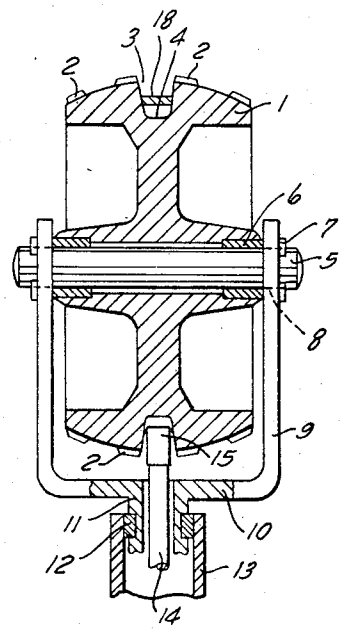
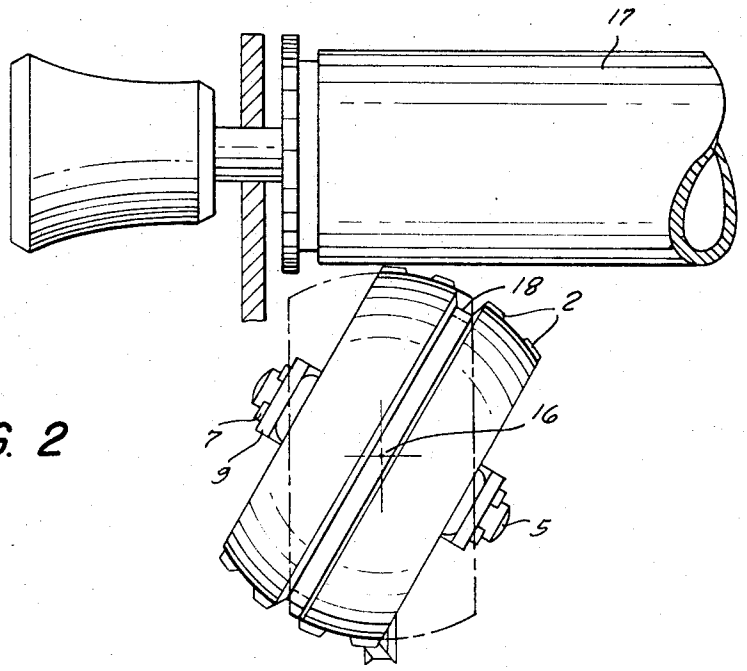


FIG. 2



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FIG. 3

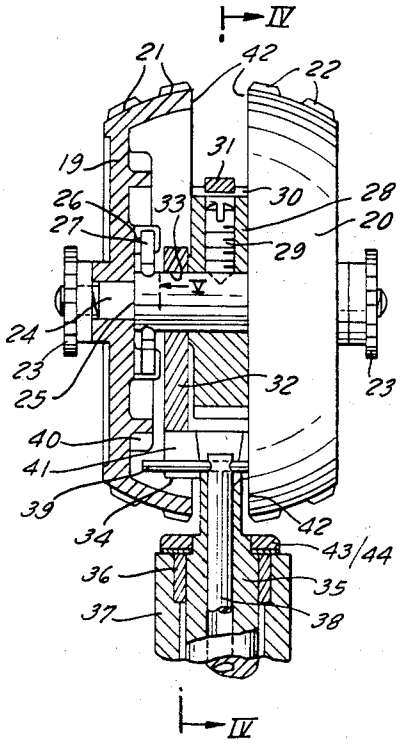


FIG. 4

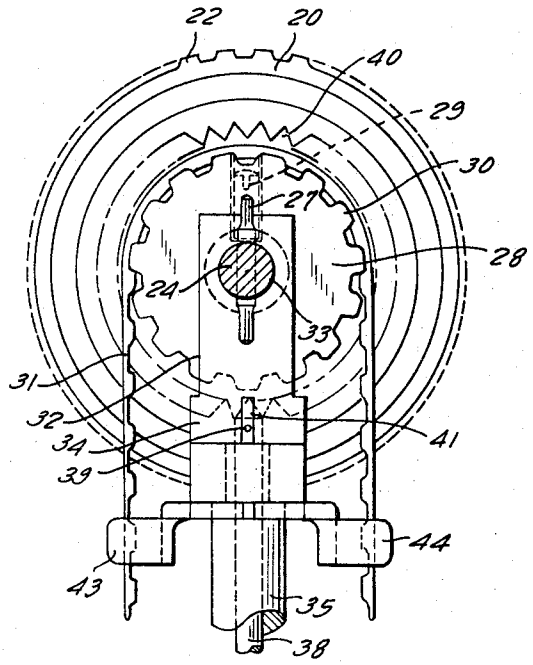
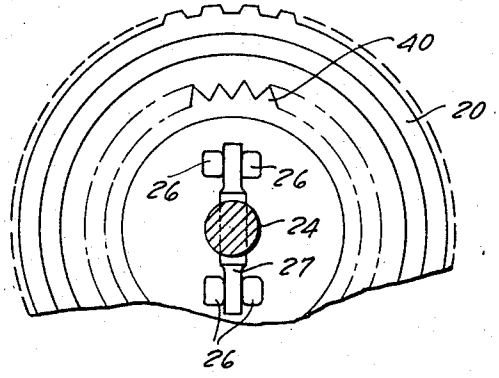


FIG. 5



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TYPE HEAD DRIVING MEANS EMPLOYING FLEXIBLE BELT

Filed Aug. 30, 1967 Sheet 3 of 4

FIG. 6

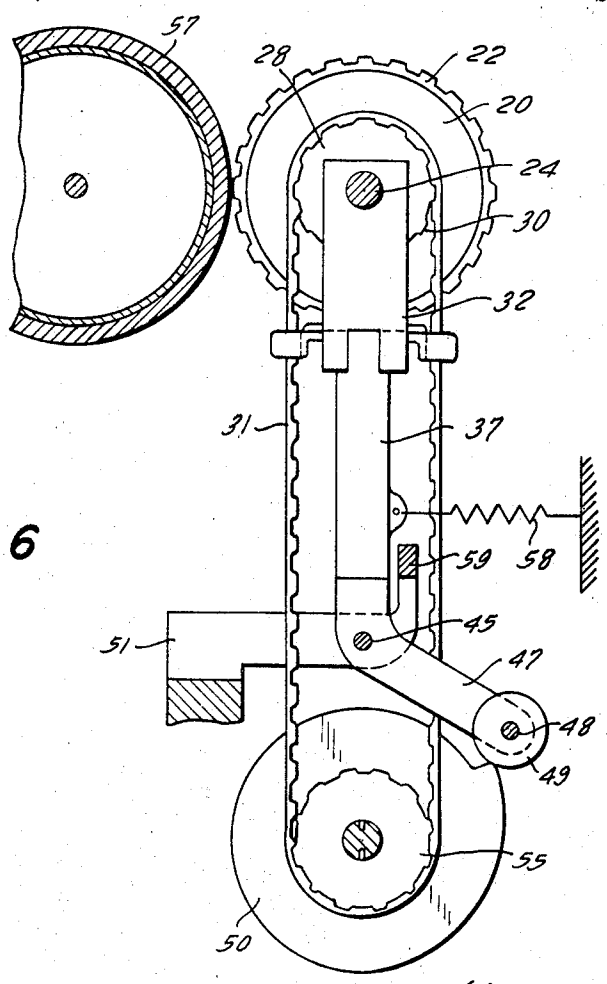
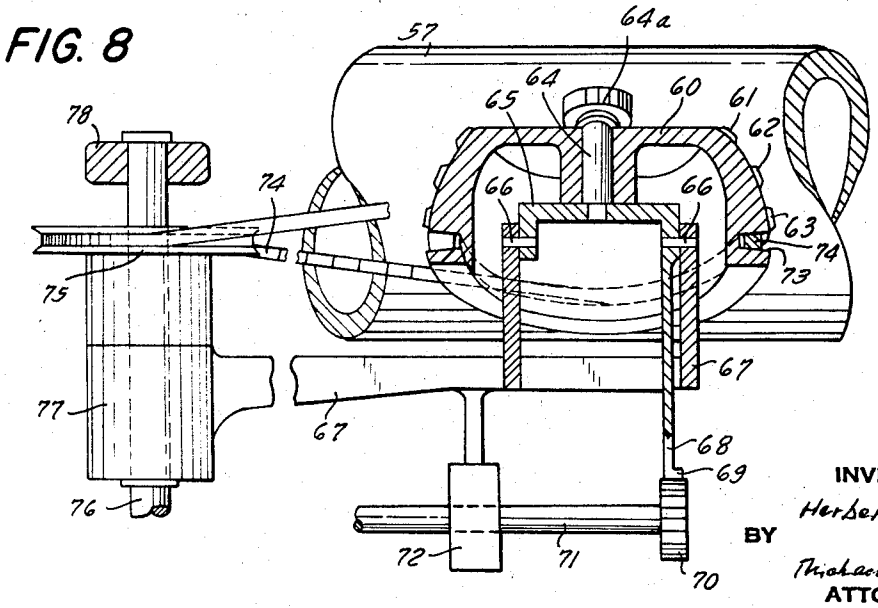


FIG. 8



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TYPE HEAD DRIVING MEANS EMPLOYING FLEXIBLE BELT

Filed Aug. 30, 1967 Sheet 4 of 4

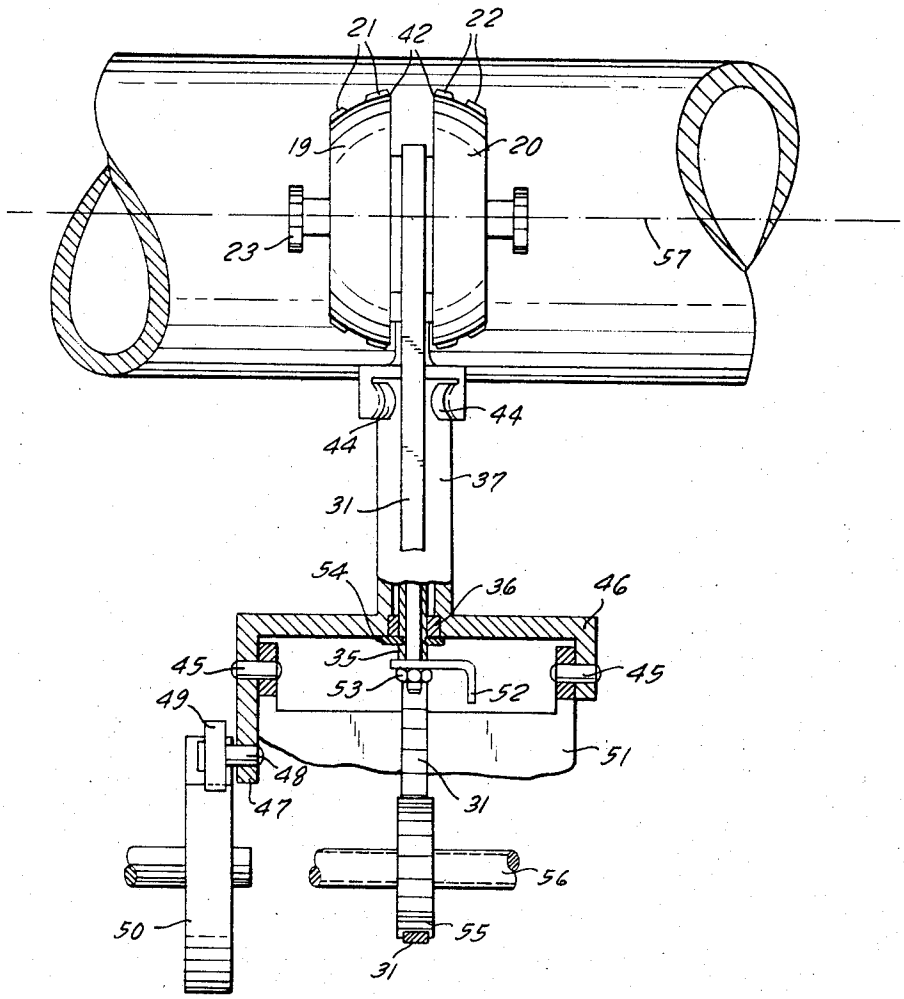


FIG. 7

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United States Patent Office 3,420,350
Patented Jan. 7, 1969

3,420,350

TYPE HEAD DRIVING MEANS EMPLOYING FLEXIBLE BELT

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Filed Aug. 30, 1967, Ser. No. 664,557
Claims priority, application Germany, Sept. 3, 1966, G 47,817
U.S. Cl. 197—16 20 Claims
Int. Cl. B41j 1/32

ABSTRACT OF THE DISCLOSURE

The type head of a business machine is mounted for angular movement about first and second axis intersecting at right angles, and is rotated about the first axis by pulley and belt means so that angular displacement of the type head about the second axis, and a printing movement about a third axis can be carried out while the belt means is slightly flexed whereby no universal joints are required.

Background of the invention

The present invention relates to an improved driving arrangement of a part-spherical type head which cooperates with the paper carrier of a business machine, such as a typewriter for making imprints of characters represented by several circular rows of type faces on the type head. The type head is rotated about a first axis passing through the centers of the circular rows of type faces, and angularly displaced about a second axis to place a selected circular row of type faces opposite the paper carrier. When the selected type face of a selected circular row is located opposite the type carrier, the type head is turned about a third axis to a printing position.

Description of the prior art

In the type head driving arrangement disclosed in the U.S. Patent 3,247,941, a tiltable frame is arranged parallel to the platen and supports a hollow shaft for turning movement in which a rod is guided carrying at one end a cylindrical type head. The transmission means by which the turning motion is transmitted to the type head, and which also serve for moving the cylindrical type head up and down, are mounted on the frame and constitute substantial masses which have to be accelerated so that the typing speed is reduced.

The construction disclosed in the German Patent 1,198,834 uses a hollow sperical type head which has circular rows of type faces requiring an angular displacement of the type head for the selection of a row of type faces. Such angular movement is necessary in addition to the rotary movement which causes a difficulty inasmuch as due to the angular displacement, the provision of a double universal joint is required. Since the play between the several parts of the transmission means and up even if tolerance limits are observed, the precision required for a perfect appearance of a line of imprints cannot be obtained. Consequently, two arresting devices are provided for arresting the type head in an angular position in which a selected circular row of type faces is located opposite the paper carrier, and for arresting the type head when the selected type face of the respective row is located opposite the paper carrier. The great number of parts requires very high precision during assembly, and great resistance to wear, and moreover, it is difficult to arrange all the required parts within the hollow type head.

The U.S. Patent 2,902,132 discloses a similar spherical type head which is rotated by a vertical drive shaft. In order to permit an angular displacement, the type head is mounted in a frame which is tiltable about an axis which is parallel to a platen and perpendicular to the drive shaft. The construction is complicated, and a great number of parts is required which have complicated shapes requiring great precision during manufacture. The masses which have to move during the printing movement are great, and the typing speed is limited.

The French Patent 1,411,426 discloses a barrel-shaped type head in which a great number of parts are mounted for operating the type head as explained above. Great masses have to be accelerated during each printing operation, and the typing speed is limited.

The U.S. Patent 2,879,876 discloses a type head controlled by selecting cams, and complicated transmission means having a substantial mass.

Summary of the invention

It is the object of the invention to improve the constructions of the prior art, and to provide a type head driving arrangement of simple construction, having only few parts of low mass, and being capable of producing accurate imprints at a high typing speed.

Another object of the invention is to provide a type head driving arrangement producing accurate spacing and positioning of the imprints produced by the type face so that the appearance of the typed lines is unobjectionable.

Another object of the invention is to provide an arrangement in which a type head can be easily exchanged for another type head having type faces according to a different font so that the same typewriter can be used for typing different alphabets, languages, or scientific symbols.

Another object of the invention is to provide flexible drive means for rotating the type head so that the angular displacement of the type head causes only slight twisting or bending of the flexible drive means and requires no universal joints.

One embodiment of the invention comprises a type head located opposite the paper carrier or platen of a business machine, such as a typewriter, and having a plurality of circular rows of type faces, carrier means supporting the type head for rotation about a first axis passing through the centers of the circular rows, supporting means supporting the carrier means for angular movement about a second axis intersecting with the first axis, selector means including an actuating means for angularly displacing the carrier means about the second axis for placing a selected row of type faces opposite the paper carrier, and drive means including pulley means connected to the type head for movement with the same about said first and second axis, and driven flexible means, such as an endless belt, in driving connection with the pulley means for rotating type head about the first axis. During the angular displacement of the type head with the pulley means for the selection of a row of type faces, the flexible means are slightly twisted or bent which has no detrimental influence on the operation.

During rotation of the type head about the first axis, the type faces of the selected row successively pass the paper carrier, and arresting means are provided for precisely arresting the type head in a position in which the selected type face of the selected row of type faces is located opposite the paper carrier.

The terms "pulley" and "flexible means" are used in the present application to define any driving connection having a flexible rope, chain, belt or cord passing over a wheel or roller.

In the preferred embodiment of the invention, the carrier means includes a carrier shaft mounted for rotation about the second axis, and having a pair of arms in which a type head shaft is mounted for rotation. The type head consists of two part spherical shells detachably secured to the type head shaft and rotating with the same. A

pulley is secured to the type head shaft and engaged at one side of its periphery by an endless belt which passes through the gap between the rims of the two type head shells. When the carrier shaft is turned, the type head shells assume angular positions in which different circular rows of type faces are located opposite the paper carriage and platen.

In another embodiment of the invention, the type head has a depressed annular portion serving as pulley about which a drive belt passes. The depressed annular portion is advantageously provided with teeth cooperating with an arresting means for locking rotation of the type head, and the arresting means are disposed on the side of the toothed arresting and pulley portion which is not covered by the drive belt.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawing.

Brief description of the drawing

FIG. 1 is a fragmentary vertical sectional view illustrating one embodiment of the invention;

FIG. 2 is a fragmentary plan view illustrating the embodiment of FIG. 1 and showing an angularly displaced position of the type head;

FIG. 3 is a fragmentary front view, partially in a vertical axial section, and illustrating a second embodiment of the invention;

FIG. 4 is a fragmentary side view of the embodiment of FIG. 3, partially in section on line IV—IV in FIG. 3;

FIG. 5 is a fragmentary sectional view taken in the direction of the arrow V in FIG. 3;

FIG. 6 is a fragmentary side view, partially in section along line IV—IV in FIG. 3, and illustrating the driving arrangement of the embodiment of FIGS. 1 to 5;

FIG. 7 is a fragmentary front view, partially in vertical section, illustrating the driving arrangement of FIG. 6; and

FIG. 8 is a fragmentary elevation partially in section, and illustrating a third embodiment of the invention.

Description of the preferred embodiments

All embodiments of the invention can be either used in business machines in which the paper carrier moves stepwise past the type head, or in business machines in which the type head is stepwise moved along the paper carrier.

Referring first to the embodiment of FIGS. 3 to 7, the supporting means of the type head includes a tubular bearing means **37** with a bearing **36** in which a hollow carrier shaft **35** is mounted for turning movement about a vertical axis. Carrier shaft **35** has a pair of arms **32** with bearing bores **33** in which a type head shaft **24** is mounted for rotation. Type head shaft **24** has a pair of threaded end portions on which nuts **23** are mounted which press two type head shells **19** against shoulders **25** so that the type head shells **19, 20** can be easily detached and replaced by other type head shells which have different type faces arranged in circular rows **21** and **22**.

The axis of type head shaft **24** and of type head **19, 20** passes through the centers of the circular rows of type faces **21, 22** and intersects the axis of carrier shaft **35** at right angles.

As shown in FIG. 7, carrier shaft **35** has a lower end mounted for turning movement in a bearing **36** at the lower end of the tubular bearing means **37**, and is connected to an actuating member **52**, which is operated in a manner which is not an object of the invention by means substantially as described in the U.S. Patent 2,879,876 to turn carrier means **35, 32, 24, 23** about a vertical axis between

four positions, in each of which one circular row of type faces **21** or **22** is located opposite the platen.

FIG. 2, which illustrates another embodiment of the invention, shows in broken lines a normal position of a type head **1** in which one of the circular rows of type faces **2** is located opposite the platen, and in solid lines an angularly displaced position of the type head **1** in which the outermost circular row of type faces cooperates with the platen.

As best seen in FIG. 5, the inner surface of each of the type head shells **19, 20** has two pairs of coupling portions **26** between which transverse coupling pins **27**, which pass through type head shaft **24**, are located. Due to this coupling connection, the angular position of the type head shells and of the type faces of the same, in relation to the axis of shaft **24**, is exactly determined, and it is in this angular position that nuts **23** are tightened.

The circular rims **42** of the type head shells **19** and **20** are spaced from each other to form an annular gap. A pulley **28** having peripheral teeth **31** is surrounded by the gap so that an endless flexible belt **31** can be inserted through the gap and placed on the teeth **30** of pulley **28**, while the other end of the endless loop of the flexible belt **31** is placed about another pulley **55** whose central bore has inner projections coupled with axially extending grooves in a drive shaft **56** so that drive pulley **55** remains coupled to drive shaft **56** for rotation, while being moved in axial direction.

When drive shaft **56** is driven by a motor, not shown, drive pulley **55** drives pulley **28** through belt **31** whose inner teeth mesh with teeth **30** of pulley **28**.

A worm screw **29** in a threaded bore of pulley **28** secures the same fixedly to type head shaft **24** so that the same is rotated and transmits the rotary movement through coupling means **26, 27** and nuts **23** to the two type head shells **19** and **20** which rotate about a first axis defined by type head shaft **24** and bearings **33** so that the type faces of the four annular rows **21, 22** successively pass the printing area.

Toothed arresting wheels **40** are formed within type head shells **19** and **20**, the teeth and notches between the same being respectively associated with the type faces of the circular rows **21** and **22** which are arranged in columns located in radial planes passing through the axis of shaft **24**.

Arresting means are provided for arresting the type head shells and include the rod **38** mounted for axial movement in the hollow carrier shaft **35**, and a transverse arresting pin **39** guided in slots **41** of arms **32** which are part of the carrier means of the type head.

When rod **38** is shifted in axial direction by means substantially as described in the U.S. Patent 2,879,876 for the selection of a type face, the two ends of pin **39** respectively engage notches of the arresting wheels **40** and stop the two type head shells **19** and **20** in angular positions in which a column of type faces including the selected type face and character, is located opposite the platen.

Pulley **55** is always located in a plane perpendicular to shaft **56** and to the axis of platen **57**. However, since type head **19, 20** is angularly displaced about the second axis defined by tubular bearing member **37** and carrier shaft **35**, pulley **28** is located in a plane slanted to the plane of pulley **55** when the type head is turned to a position in which one of the outer circular rows of type faces is operative.

In order to prevent a transverse displacement of a flexible belt **31** on one of the pulleys, fork-shaped guide means **44, 43** are fixedly secured to carrier shaft **36**, located in a plane perpendicular to shaft **24** and positioned for holding the flexible belt **31** parallel to the circular rims **42** of the type head shells **19, 20** so that rims **42** cannot be engaged by the moving flexible belt when the type head is angularly displaced about the axis of carrier shaft **35**.

The tubular supporting and bearing member **37** has a forked lower end portion, best seen in FIG. 7. The arms **46** have bearing bores receiving journals **45** secured to the arms of a stationary bracket member **51** so that tubular bearing member **37** is turnable about the third axis defined by journals **45** between a position in which the type head is spaced from the platen, and a printing position in which a type face of the type head produces an imprint. One arm **46** is extended at **47** and carries a journal **48** on which a cam follower roller **49** is mounted for cooperation with a cam **50**. When the cam lobe of cam **50** engages follower roller **49**, supporting means **47, 46, 37, 36** is angularly displaced about the axis of journals **45** to place the type head in the printing position shown in FIG. 6. When a lower portion of cam **50** is located opposite follower roller **49**, a spring **58** secured to the tubular member **37** moves the same and thereby the type head away from platen **57**.

From the above description of the embodiment of FIGS. 3 to 7 it is apparent that drive means **56, 55, 31, 29, 28** rotate type head shaft **24** with type head shells **19, 20** about a first axis defined by shaft **24** and bearing bores **33** while type faces of the circular rows of type faces **21** and **22** pass the printing area. When the selection of a character and type face is desired, an actuating means **52** controlled from the keys of the machine, not shown, and secured by nut means **53** to carrier shaft **35**, turns the carrier means **35, 32** about the second axis defined by carrier shaft **35** and tubular supporting and bearing member **37** until the circular row of type faces containing the selected character is located opposite the paper carrying platen.

Thereupon, arresting means **35** is operated when the selected type face is located opposite the printing area, so that arresting pins **39** engage notches between the teeth **40** of the arresting wheels and stop the latter in the desired position in which the selected character of the selected row of type faces is located opposite the platen.

When carrier means **35, 32** is turned, guide means **43, 44** thereon turn the belt portion which passes over pulley **28** relative to pulley **55** so that the edges of belt **31** cannot engage rims **42** of the type head shells. The belt portions respectively embracing pulleys **28** and **55** are slightly twisted relative to one another when the type head and the belt guide means **43, 44** are angularly displaced. Cam **50** turns supporting means **47, 46, 37**, with carrier means **35, 32**, type head shaft **24** and type head **19, 20** about a third axis defined by journals **45** to a printing position.

The embodiment illustrated in FIGS. 1 and 2 is operated as described with reference to FIGS. 6 and 7. However, the type head construction is simplified.

An integral type head **1** has a part spherical surface having four circular rows of type faces **2**. A recessed annular portion in the plane of symmetry of type head **1** has peripheral arresting teeth **4** and forms a recess **3** in the surface of the type head. A type head shaft **5** is located in bores **8**, and fixedly secured to a pair of carrier arms **9** which project from a carrier shaft **11** mounted by means of bearings **12** for turning movement about a vertical axis in the tubular bearing and supporting member **13**. Carrier shaft **11** corresponds to carrier shaft **35**, and tubular bearing and supporting member **13** corresponds to member **37** of the embodiment of FIGS. 3 to 7, and is operated as described with reference to FIGS. 6 and 7. Carrier shaft **11** is hollow and guides an arresting means **14** for axial movement between an inoperative retracted position, and an advanced position shown in FIG. 1 in which its end portion **15** projects into a notch between two adjacent arresting teeth of the recessed annular portion of the type head for arresting the same in an angular position in relation to the axis defined by type head shaft **5** on which type head **1** is mounted for rotation by means of bearings **6**.

The arresting wheel constituted by teeth **4** in groove **3** also serves as the pulley by which the type head is driven, corresponding to the function of pulley **28** in the embodiment of FIGS. 3 to 7. An endless flexible belt **18** passes over the upper half of the toothed recessed annular portion, and over another pulley which is arranged as described with reference to FIGS. 6 and 7. Since the lower portion of the toothed annular portion is not covered by the loop of the endless belt, arresting means **14** can cooperate with teeth **4**. Consequently, the recessed annular portion in recess **3** performs both the functions of a pulley and of an arresting wheel.

The vertical axis **16** defined by carrier shaft **11** intersects the horizontal axis of the type head shaft **5** at right angles. The normal position of the type head is illustrated in broken lines in FIG. 5, and it will be understood that the type head can be angularly displaced about axis **16** to the position shown in solid lines in which one of the outer circular rows of type faces **2** cooperates with the platen **17**. It is apparent from FIG. 2 that in this position, the portion of belt **18** engaging the recessed annular groove of the type head is twisted since the other end of the endless flexible belt is maintained in initial position by the other pulley, not shown, which corresponds to pulley **55** described with reference to FIGS. 6 and 7.

The tubular member **13** is mounted for turning movement about a third axis, corresponding to journals **45**, and is operated to move the type head toward and away from the platen **17** by cam means described with reference to FIGS. 6 and 7.

Another embodiment of the invention is illustrated in FIG. 8. A substantially bell-shaped type head **60** has three circular rows **61, 62, 63** of character type faces and has a closed end formed with a bearing portion mounted on type head shaft **64** for rotation about a first axis, and is detachably held on type head shaft **64** by a nut means **64***a* which abuts a shoulder on type head shaft **64**. Type head shaft **64** is secured to a bridge member **65** having two arms mounted for turning movement about a second axis defined by carrier journals **66** which are secured to supporting arms of a supporting bracket **67** whose hub **77** is mounted on a shaft **76**.

One arm of member **65** is extended at **68** and carries a gear segment **69** meshing with a gear **70** on a shaft **71** turnably mounted in a bearing **72** secured to bracket **67**. Gear **70** is an actuating means for turning carrier means **68, 65, 64** about the axis defined by journal **66** between angular positions in which different circular rows of type faces **61, 62, 63** are located opposite the platen **57**.

The bell-shaped type head **60** has an open end into which the supporting arms of bracket **67** project.

Adjacent the open end, a recessed annular portion and groove **73** which is provided with teeth and constitutes a pulley one side of which is engaged by a portion of an endless flexible belt **74** which also passes about another pulley **75** whose shaft **76** is mounted for rotation in bearings **77** and **78** of supporting bracket means **67**.

When drive shaft **76** is driven, pulley **75** drives flexible belt **74** and thereby the type head **60** which rotates about the axis defined by shaft **64**. Actuating gear **70** turns the type head about the carrier axis defined by journal **66** to a position in which the circular row of type faces containing the selected character is located in an operative position opposite the platen, and rotation of the type head **60** is stopped at the proper moment by an arresting means, not shown, engaging the teeth of the recessed annular portion **73**, as described with reference to FIG. 1. The type head is operated to produce the imprint of the selected character.

In a position of the type head **60** displaced about the axis of journals **66**, belt **74** is slightly twisted.

Summarizing, in all embodiments of the invention, three motions of the type head can be carried out.

(1) The type head **1**, or **19, 20**, or **60** is rotated about

a first axis **5, 24, 64** so that the type faces of the circular rows successively pass the paper carrier **17, 57**.

(2) The type head is angularly displaced about a second axis **11, 35, 66** intersecting the first axis at right angles and passing through the plane of the belt and pulley. Actuating means **52, 70** of selector means perform this function by which one selected circular row of type faces is placed in an operative position. An arresting means **14, 39** engages a corresponding arresting wheel secured to the type head for stopping rotation of the same in a position in which the selected type face of the selected circular row of type faces is located opposite the platen.

(3) Supporting means **37, 46** is turned about a third axis **45** for moving the type head to the printing position.

Additionally the type head is moved along the platen while pulley **55** moves in axial direction on drive shaft **56** but remaining coupled with the same for rotation, or the paper carriage is moved relative to the type head, as is known to those skilled in the art.

From the above description, it becomes apparent that the present invention provides very simple apparatus for obtaining the three necessary motions of the type head. All parts which move with the type head are small and light, so that the accelerated mass is small, and a high typing speed can be achieved. The apparatus permits a precise positioning of each type face so that a perfect appearance of a printed line is assured.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of type head arrangements differing from the types described above.

While the invention has been illustrated and described as embodied in a type head driving arrangement including a pulley and belt means for rotating the type head about a main axis and permitting angular displacement of the type head about a second axis, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be protected by Letters Patent is set forth in the appended claims.

I claim:

1. Type head driving arrangement for use in a business machine having a paper carrier, comprising, in combination, a type head located opposite said paper carrier and having a plurality of circular rows of type faces; carrier means supporting said type head for rotation about a first axis passing through the centers of said circular rows; supporting means supporting said carrier means for angular movement about a second axis intersecting with said first axis; selector means including an actuating means for angularly displacing said carrier means about said second axis for placing a selected row of type faces opposite said paper carrier; and drive means including driven pulley means connected to said type head for movement with the same about said first and second axes, drive pulley means mounted for rotation about a stationary axis, and driven flexible means in driving connection with said drive pulley means and driven pulley means for rotating said type head about said first axis so that the type faces of the selected row successively pass said paper carrier, said flexible means being twisted when said carrier means and driven pulley means are angularly displaced about said second axis relative to said drive pulley means.

2. Type head driving arrangement as claimed in claim **1** wherein said drive means include a drive shaft parallel to said first axis, and wherein said drive pulley means is mounted on said drive shaft for axial movement and is connected to the same for rotation.

3. Type head driving arrangement as claimed in claim **1** wherein said driven pulley means is located in a plane passing through said second axis perpendicularly to said first axis and has a normal position in which said drive pulley means is located in said plane, said driven pulley means having at least one position angularly displaced relative to said drive pulley means about said second axis in which position a selected row of type faces is placed opposite said paper carrier so that said flexible means is twisted.

4. Type head driving arrangement as claimed in claim **1** wherein said carrier means includes carrier shaft means mounted on said supporting means for angular movement about said second axis and being connected with said actuating means; wherein said driven pulley means is secured to said type head and located in a plane passing through said second axis perpendicular to said first axis, wherein said flexible means form an endless loop having a loop portion in engagement with said pulley means; and comprising guide means for said endless loop secured to said carrier shaft means and engaging said loop portion for angularly displacing said loop portion with said driven pulley means when said carrier shaft means is turned about said second axis with said type head and pulley means so that said loop portion remains in said plane of said driven pulley means while said driven pulley means turns relative to said drive pulley means.

5. Type head driving arrangement as claimed in claim **1** wherein said driven pulley means is provided at one end of said type head on one side of said rows of type faces; wherein said one end of said type head is open; wherein said carrier means include a carrier shaft supporting the other end of said type head for rotation, about said first axis, and having two arms located in said type head; and wherein said supporting means include a pair of arms projecting into said open end and supporting said arms and thereby said carrier means and type head for angular movement about said second axis.

6. Type head arrangement as claimed in claim **1** wherein said driven pulley means is located in a plane passing through said second axis perpendicularly to said first axis; and wherein said first and second axes extend at right angles to each other.

7. Type head driving arrangement as claimed in claim **1** wherein said driven pulley means is secured to said type head for rotation about said first axis; comprising an arresting wheel having peripheral teeth and secured to said type head for rotation about said first axis; and wherein said selector means include arresting means mounted on said carrier means for movement to and from an arresting position engaging a tooth of said arresting means and blocking rotation of the same; and wherein said flexible means engage one side of said driven pulley means and leave the other side of the same free, said arresting means engaging said other side.

8. Type head driven arrangement as claimed in claim **1** and compising means mounting said supporting means for angular movement with said carrier means and said type head toward and away from said paper carrier about a third axis parallel to said first axis.

9. Type head driving arrangement as claimed in claim **1** wherein said driven pulley means is an annular groove in said type head located on one side of said plurality of annular rows of type faces.

10. Type head driving arrangement as claimed in claim **1** wherein said driven pulley means is located in a plane of symmetry of said type head passing through said second axis at right angles to said first axis.

11. Type head driving arrangement as claimed in claim 10 wherein said driven pulley means is an annular groove in said type head located between two rows of type faces.

12. Type head driving arrangement as claimed in claim 1 wherein said carrier means includes carrier shaft means mounted on said supporting means for angular movement about said second axis and connected with said actuating means, and a type head shaft means mounted on said carrier means for rotation about said first axis and being secured to said type head for movement therewith; and wherein said driven pulley means is secured to said type head shaft means.

13. Type head driving arrangement as claimed in claim 12 wherein said type head includes a pair of type head shells secured to said type head shaft means spaced from each other and having annular rims forming an annular gap having a greater diameter than said driven pulley means and surrounding the same; and wherein said flexible means passes through said gap and partly around said driven pulley means, and is narrower than said gap.

14. Type head driving arrangement as claimed in claim 13, wherein said carrier shaft means includes a carrier shaft having a fork shaped portion with two arms having bearings; wherein said type head shaft means includes a type head shaft mounted in said bearings and radial coupling pins projecting from the ends of said type head shaft; and wherein said type head shells have coupling portions on the inner surfaces thereof located on opposite sides of said coupling pins for coupling said shells with said type head shaft.

15. Type head driving arrangement as claimed in claim 14 wherein said type head shaft has threaded end portions projecting through bores in said shells and having shoulders within said shells; and wherein said carrier means include nuts on said threaded end portions pressing said shells against said shoulders for detachably securing said shells to said type head shaft in angular positions determined by said coupling pins.

16. Type head driving arrangement as claimed in claim 13 wherein said supporting means includes a tubular bearing means supporting said carrier shaft means for rotation; comprising means for mounting said tubular bearing means for angular movement about a third axis parallel with said first axis for moving said type head toward and away from said paper carrier; and means for tilting said tubular bearing means with said carrier means and said type head about said third axis.

17. Type head driving arrangement as claimed in claim 16 wherein said carrier shaft means includes a hollow shaft; wherein each type head shell has an inner toothed arresting wheel; and wherein said selector means include an arresting means mounted in said hollow carrier shaft for axial movement between a normal position and an arresting position, and including an arresting member engaging in said arresting position teeth of said arresting wheels for arresting the same for holding a selected type face of a selected row of type faces opposite said paper carrier.

18. Type head driving arrangement as claimed in claim 17 wherein said flexible means is an endless belt having a portion in engagement with one side of said driven pulley means; wherein said arresting means and said hollow shaft are located opposite the other side of said pulley means within said endless belt; said driven pulley means and said belt being located in a plane passing through said second axis perpendicular to said first axis, said belt being twisted when said driven pulley means is turned with said type head about said second axis.

19. Type head arrangement as claimed in claim 1 including teeth secured to said type head for rotation about said first axis; and wherein said selector means include arresting means mounted on said carrier means for movement to and from an arresting position engaging a tooth of said type head and blocking rotation of the same in an angular position in which a selected type face of said selected row of type faces is located opposite said paper carrier.

20. Type head driving arrangement as claimed in claim 19 wherein said driven pulley means is an annular recessed portion of said type head having teeth and constituting also said arresting wheel; and wherein said flexible means forms and endless loop engaging one side of said annular recessed portion and leaving the other side free; and whrein said arresting means is located on said other side for cooperating with the teeth of said annular recessed portion.

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U.S. Cl. X.R.

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