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(54) Improved suspension system for franking machine printing head.

(57) A franking machine contains a printing head which itself includes at least one print face on the underside thereof which, when inked, will form an impression on the surface of an envelope or packet placed on the platen wherein the printing head is pivotally attached to a freely pivoted arm with the axis of pivoting parallel to and closely spaced from the plane containing the print face (or lies in the plane containing the print face) so as to reduce sliding movement of the print face relative to an envelope or packet during downward movement of the printing head, a non-gravitational centering device resiliently holds the printing head in a fixed orientation relative to the freely pivoted arm and a thrust means is provided for exerting a thrust on the arm in a direction and at a position relative to the pivotal attachment of the arm to the remainder of the franking machine, to urge the end of the arm carrying the printing head in a generally downward direction towards the platen during a printing operation.

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Title: Improved suspension system for franking machine printing head

DESCRIPTION

Field of invention

This invention concerns franking machines and, in particular an improved suspension system for printing heads fitted therein.

Background to the invention

Relative movement must be provided for between a printing head containing inked characters for forming an impression on an envelope or packet and a platen in which the envelope or packet is rested during franking.

Additionally, differing thicknesses of envelope and packet have to be accommodated whilst maintaining substantially constant printing head pressure on the surface to be impressed.

The present invention seeks to provide an improved suspension system for such printing heads.

Summary of the invention

According to one aspect of the present invention, in a franking machine containing a printing head which itself includes at least one print face on the underside thereof which, when inked, will form an impression on the surface of an envelope or packet placed on the platen, the printing head is pivotally attached to a freely pivoted arm with the axis of pivoting parallel to and closely

spaced from the plane containing the print face or lying in the plane containing the print face so as to reduce sliding movement of the print face relative to an envelope or packet during downward movement of the printing head, a non-gravitational centering device resiliently holding the printing head in a fixed orientation relative to the freely pivoted arm and means for exerting a thrust on the arm in a direction and at a position relative to the pivotal attachment of the arm to the remainder of the franking machine to urge the end of the arm carrying the printing head in a generally downward direction towards the platen during a printing operation.

Preferably, the arm is normally held in an elevated position relative to the platen under the action of a spring or other resilient device and is urged thereby against stop means determining the said elevated position.

By mounting the printing head pivotally relative to the arm and moving the arm relative to the platen so the print face is capable of both an up and down movement relative to the platen and a tilting movement about the axis of pivoting relative to the arm.

By providing a freely pivoting connection between the print head support arm and the remainder of the franking machine, so a further degree of freedom can be given to the print face. By a freely pivoting connection is meant a semi-universal coupling and is obtained by securing the end of the arm remote from the print head to a base member on which the platen is fixed, by means of a screw or like member which passes through an aperture in the arm which is larger than the shank of the screw but smaller than the

head so that the arm is held captive but can move to a limited degree from side to side as well as up and down relative to the base member. In this way, the printing head and therefore the print face can be provided with a further degree of freedom, albeit limited in angular extent about an axis generally perpendicular to the first axis of pivoting of the head.

By arranging that the force acting on the arm acts at a point along a straight line passing through the freely pivoting connection at the rear of the arm and generally perpendicular to the axis of pivoting of the print head relative to the arm and further arranging that the resilient spring means or the like acting on the arm to hold the latter normally in its elevated position also acts at a point along the same straight line, so the print head can be considered to be fully floating within the angular movement permitted by the various supports for the arm and to this end, as the printing head and print face is lowered towards a packet or envelope, so the print face carried by the printing head will be capable of conforming to any inclined surface presented to the print face by a packet or envelope located on the platen, within the angular movements of the print head relative to the arm and the arm relative to the platen.

Conveniently the downward force on the arm is provided by means of a cam which rotates through an over centre position to depress the arm towards the platen.

Preferably the arm is in the form of a yoke having two extensions which fit one on either side of the print head and provide two mounting points for stub-axles to permit the printing head to be pivotally attached to the yoke.

According to a particularly preferred feature of the invention, the freely pivoting connection at the rear of the arm or yoke comprises a lost motion connection in a vertical sense and the rear of the arm is capable of being pushed in downward direction through a small distance from its normal position where it engages the head of the retaining member such as a screw under the action of the spring means aforementioned. By providing this form of coupling between the arm and the baseplate, it will be seen that the force exerted between the print face and the surface of an envelope or packet to be impressed can be maintained constant, equal to the spring rate of the spring means acting on the arm since movement of the cam through the over centre position after the print face has engaged the envelope or packet surface and can move no further, will simply cause the arm to move relative to the rear mounting in a direction towards the baseplate so extending the spring means acting on the arm. It will thus be seen that a constant print pressure can be obtained which is to considerable advantage since packets and envelopes vary in thickness and surface material quite considerably and unacceptabbly high printing impression pressures could be achieved if no provision were made to accommodate thicker packages.

In a particularly preferred embodiment, the cam acting on the yoke is carried by an axle which extends parallel to the axis of pivoting between the print head and the arms of the yoke and the latter include upturned sidecheeks which are adapted to engage the underside of the axle carrying the cam when the yoke is in its elevated position relative to the platen.

Conveniently a second axle or rod extends parallel to the first mentioned axle to the rear thereof and the spring means is attached at one end to the second mentioned rod or axle and at its lower end to the yoke.

Preferably, the spring point of attachment, point of contact between the cam and yoke and rear lost motion connection between the yoke and the baseplate all lie on the same straight line which itself is generally perpendicular to the axis of pivoting of the printing head relative to the yoke.

Conveniently a second cam is located at one end of the axle containing the first mentioned cam and a microswitch is provided operated by rotation of the second mentioned cam so as to indicate when the axle containing the first mentioned cam occupies a given angular position corresponding to the home position of the yoke.

The printing head preferably includes means for adjusting at least some of the characters and information contained in the print face to permit variation of postal value and date.

Preferably means is provided within the printing head for generating electrical signals indicative of the selected postal value and/or date to permit remote indication of the selected values and date.

Preferably drive means for altering the characters and data in the print face is also carried by the printing head.

Preferably inking means is also contained within or on the printing head to cause the print face to be inked sufficiently often or regularly to ensure that a good impression is always obtained however many times the printing head is operated.

According to a further preferred feature of the invention, the printing head and associated yoke form a sub-assembly which is duplicated along the print path so that two or more independent printing heads can be provided within the same franking machine, one dedicated to printing the postal value information, another dedicated to printing the date and town and a third optional sub-assembly dedicated to printing advertising material or other promotional material as part of the franking of the envelope.

A common drive means in the form of a single axle having separate cams operating on each of the yokes for the different sub-assemblies may be provided so that a single drive can be used to actuate all three print heads simultaneously.

Conveniently the non-gravitational centering device for maintaining a constant orientation of the printing head relative to the yoke or arm comprises a spring, typically a coil spring, having two radiating arms, one attached to the yoke and the other to the printing head so that tilting of the printing head about the axis of pivoting between it and the yoke in either direction of rotation about the said axis will be resisted by the spring so that the latter will always return the printing head to a constant position relative to the yoke after a printing operation which has caused the head to be tilted about the

axis of pivoting between it and the yoke.

The invention will now be illustrated by way of example with reference to the accompanying drawings in which

Figure 1 is a perspective view of a printing head and platen mechanism embodying features of the invention;

Figure 2 is a second perspective view of the mechanism of Figure 1 from a different angle;

Figure 3 is a side view of the mechanism of Figure 1 viewed in the direction of arrow 3 and with the sideplate removed;

Figure 4 is a similar side view of the mechanism shown in Figure 1 viewed from the opposite direction to that of arrow 3 and with the sideplate removed;

Figure 5 is a diagrammatic side view showing part of the printing and indexing mechanism contained within the printing head of the mechanism shown in Figures 1 and 2;

Figure 6 is a top plan view of the mechanism shown in Figure 1;

Figure 7 is an underside view of the same mechanism;

Figure 8 is a top plan view, partly diagrammatic in format, of a complete printing head assembly for a franking machine incorporating printing head mechanisms such as shown in Figures 1 to 7;

Figure 9 is a front elevation of the apparatus shown in plan in Figure 8 with protective covers removed to illustrate the interior of the printing heads;

Figure 10 is a view in the direction of arrow 10 in Figure 9 with some of the elements removed for clarity to illustrate the indexing and printing mechanism within one of the printing head mechanisms of Figure 9;

Figure 11 is a side view of the apparatus shown in Figure 9 viewed in the direction of arrow 11 in Figure 9 illustrating relative layout of component parts;

Figure 12 illustrates the interior of a drive wheel ratchet having a uni-directional characteristic, and

Figure 13 is a cross-section of the drive wheel ratchet arrangement of Figure 12.

Figure 14 is an underside view of the printing head of Figures 1 - 7 shown partly in cross-section on a plane through the axis of rotation of the shafts 80, 82; and

Figure 15 is an underside of the platen and head assembly of Figures 1 - 7 with the coverplate 52 of Figure 7 removed.

Detailed description of drawings

In Figures 1 and 2 there is shown a basic printing head mechanism of the type which can be incorporated into a franking machine or the like. The mechanism shown in Figures 1 and 2 and the subsequent five Figures is intended to illustrate the principle of operation and

construction more clearly than is the case when the components are miniaturised and compacted more densely than in the mechanism shown. A final form of the apparatus illustrating the use of the same type of printing head in a parallel multi-head arrangement in a franking machine is shown in later Figures.

In the drawings a baseplate 10 serves as a support for two sideplates 12 and 14. A drive motor and gearbox assembly (not shown in detail) 16 is attached to and extends beyond the side wall 14 and serves to rotate a drive shaft 18 carrying a main print head operating cam 20 and a supplementary switch-actuating cam 22.

Also between the two sidecheeks 12 and 14 extends a second shaft or rod 24 which is parallel to but spaced from and to the rear of the drive shaft 18.

The printing head comprises a generally rectangular housing 26 which is pivotally attached at 28 on the one side and at a similar point (not visible in the drawings) on the other side of the housing 26 by means of stub-axles, to opposite side members 30 and 32 respectively of a yoke assembly generally designated 34.

The latter is relatively freely floating in that it is secured to the baseplate 10 through a lost motion connection best seen in Figures 3 and 4. This comprises an upstanding pin 36 having an enlarged head 38 which holds captive the generally flat plate section of the yoke assembly 34. The latter includes an aperture (not shown) which is oversize relative to the diameter of the pin 36 so that the plate of the yoke assembly 34 can, in fact, tilt to one side or the other as well as in a generally up

and down manner relative to the baseplate 10.

The yoke assembly is held in place by means of a spring 40 located between a point of attachment at 42 in the middle of the plate of the yoke assembly 34 and attached to a fisher plate 44 which itself is threaded on the rod 24 extending between the two sidecheeks 12 and 14. The spring is selected so as to still be in tension when the side arms of the yoke assembly 30 and 32 engage the underside of the axle 18 which is the normal centralised position for the assembly under the action of the spring 40.

The yoke assembly and therefore the printing head 26 can be moved in a downward direction for printing by rotation of the cam 20 to deflect the yoke 34 in the direction of the arrow 46 (see Figure 3).

The printing head includes a print face 48 containing characters which, if inked, will leave a suitable impression on an envelope or letter situated thereunder and aligned with and below the print face 48 is a platen 50 which is located in position by means of an underplate assembly 52 secured in position by means of four screws as can best be seen in Figure 7.

Removal of the plate 52 gives uninterrupted access through an aperture (not shown) in the baseplate 10, to the print face 48 to facilitate checking, cleaning and replacing members of the print head assembly.

The orientation of the print head 26 relative to the yoke arms 30 and 32 is maintained by means of at least one spring best seen in Figure 1. The spring includes two

radial arms 52 and 54 and is looped at its centre around the protruding end of the stub-shaft 28 the outboard end of which is enlarged to prevent the spring loop from leaving the stub-shaft.

The outboard ends of the radial arms 52 and 54 are secured on the one hand in an aperture 56 in the arm 30 and around a fixed stand-off 58 attached to the side of the print head housing 26.

A similar spring (not shown) is provided on the other side of the housing 26 between it and the other arm 32 of the yoke assembly.

The springs are selected so as to hold the print head housing 26 in the orientation shown in Figures 1, 2 and 3. Any attempt to tilt the head 26 in either direction denoted by the double-headed arrow 60 in Figure 3 will be resisted by the spring and the restoring force stored in the spring will tend to return the housing 26 to the orientation shown in Figures 1 to 3 as soon as any force tending to tilt the housing 26 relative to the yoke assembly is removed. Such a tilting force is, of course, exerted on the printing head assembly 26 in the event that an envelope or package is located below the print face 48 which is not of uniform thickness so that part of the print face is prevented from travelling in a downward direction by the same amount as another part of the print face.

The interaction of the two arms 30 and 32 with the rod 18 serves to centralise the yoke assembly and therefore the housing 26. However, once the cam 20 has rotated so as to depress the yoke assembly in the direction of the arrow

46, the interaction between the arms 30 and 32 ceases and the yoke assembly becomes freely floating by virtue of the fact that the point of contact between the cam 20 and the yoke plate, the point of attachment 42 of the spring 40 with the yoke plate and the rear mounting pin 36 are all on a straight line which is substantially perpendicular to the axis of pivoting of the head 26 relative to the yoke assembly and established by the stub-shafts of which one is denoted by reference numeral 28.

As a consequence the head 26 can, relative to the baseplate 10 and therefore the platen 50, tilt not only in the direction of the double-headed arrow 60 but also from side to side as indicated by the curved arrows 62 and 64 in Figure 1. The printing head can therefore accommodate gross unevenness in a packet or envelope located therebelow.

The printing head itself includes four endless belts of which one is shown at 66 in Figure 5, arranged in parallel-spaced arrangement within the head. Each follows a generally oval path and at its lower end passes around an inking reservoir and transfer pad not shown in detail but designated by reference numeral 68. To this end the material from which the endless loop 66 is formed is preferably porous at least to certain printing inks and forms a so-called retentive pad porous rubber printing medium. The belt or loop 66 is formed around its external surface with a series of upstanding segments such as 70 and 72 each of which can if desired carry a character in relief which when the material forming the belt or loop 66 is saturated with ink will form an impression of the character on a sheet of paper or the like located below the printing head in the position designated in dotted

outline at 74. To this end, an opening is provided in the underside of the housing through which the lowermost of the segments 70, 72 etc can just protrude and in the illustration this is denoted by reference numeral 76.

At its upper end the belt passes around a driving pulley 78 which is either mounted directly onto one of the two head driveshafts 80 or 82 or is connected thereto through the intermediary of a uni-directional clutch (to be described). In Figure 5 the driving wheel 78 can be thought of as comprising the shaft 80 or mounted thereon.

Drive for the shaft 82 is provided by a first electric motor 84 the output shaft of which includes a toothed pinion 86 which meshes with a gearwheel 88 which in turn drives a second toothed pinion 90 for driving a larger diameter gearwheel 92 splined or otherwise secured to the shaft 82.

For clarity, the second motor and gear train for driving the other aligned but separate shaft 80 are not shown in Figures 1 and 2. However, it is to be understood that the second motor is mounted back-to-back and may be in axial alignment with a first motor and a second gear train similar to that transmitting drive between the first motor and the shaft 82 is provided between the second motor (not shown) output shaft and the shaft 80.

Each of the two shafts 80 and 82 extends into the housing 26 by a sufficient amount to almost touch the opposite end of the other shaft. However, the two shafts are entirely separate from a rotational point of view.

Within the housing 26, two of the four endless belts such as 70 are driven by one of the shafts 80 and another two are driven by the shaft 82.

As will hereinafter be described, one of the endless belts in each pair is driven through a uni-directional clutch so that rotation of the shaft, for example, 80, in one direction will rotate both of the endless belts associated therewith but in the other direction will only drive the endless belt which is directly connected to the shaft or to a driving wheel itself non-rotatably secured on the shaft. Consequently, the two endless belts can be independently set so as to present selected characters such as 76 for printing by first of all rotating both of the endless belts in one direction until the first character associated with the clutched belt is in position and thereafter rotating the shaft in the opposite sense until the other character associated with the fixed wheel or belt has been moved into position.

The other pair of endless belts can be set in a similar manner by rotation of the other motor, first in one direction and then the other.

Although not shown, it is to be understood that a separate uni-directional clutch may be provided for each drive to each of the belts so that both belts are completely independent and rotation of the shaft such as 80 in one direction will only cause one of the belts to be rotated whilst rotation in the other direction will cause the other belt to be rotated.

It is, of course, not easy to see which particular character has been displayed in the window on the

underside of the printing head for any particular belt and to this end a toothed indexing wheel is associated with each individual belt. One such wheel is shown at 94 in Figure 5. The spacing between the teeth around the indexing wheel 94 is commensurate with the spacing between the upstanding segments such as 70, 72 around the endless belt 66 so that as the belt rotates so the indexing wheel must rotate by a corresponding number of segments. The indexing wheel 94 includes one or more electrical contacts (not shown) which, as the wheel 94 is indexed, make different combinations of connection between a plurality of conductors designated by reference numerals 96 and 98 by way of example only, carried by a conductor card 100 sandwiched between the index wheel 94 and the next index wheel along. These cards are more clearly shown in Figure 1 and it will be noted that flying leads such as 102 are connected to the conductors such as 96, 98 etc for conveying the pattern of electrical connections to a microprocessor or the like to establish the precise positions of the four index wheels 94. By appropriately coding the electrical connections, so an electrical signal can be derived indicative of the angular position of each of the four wheels 94 which therefore corresponds to the rotational position of the associated four endless belts 66 and therefore the four characters or groups of characters contained by the belts in the window in the underside of the printing head 26.

The window and surrounding framework constitutes a print face 48 of Figure 3.

In Figures 2, 3 and 6 the bundle of conductors to the conductor cards 100 are only shown leading to one of the cards. In practice, a single bundle would in fact be

led to and make connection with each of the cards as is shown in Figure 1.

Reverting to Figure 1, a microswitch 104 is shown mounted close to the second cam 22 mounted on the shaft 18 with the microswitch actuating lever 106 acting as a cam follower. The cam is shaped and fitted to the shaft 18 so that the microswitch is operated once every revolution of the shaft 18 and is opened (or closed) as required at a position in which the lobe of the cam 20 is furthest from the plate of the yoke assembly 34.

The design of print head assembly shown in Figures 1 to 7 is eminently suitable for incorporation into a franking machine in which a plurality of such head assemblies are located side by side. Each different head assembly can then be dedicated to one particular task associated with the franking of mail and appropiate characters and printing devices are located in each such dedicated printing head assembly.

Arrangements such as this is shown in Figure 8 where four such printing heads are mounted at the end of four freely floating yoke or arm assemblies. The four printing heads are designated 108, 110, 112 and 114 and their respective support arms by the reference numerals 116, 118, 120 and 122.

Actuating cams, each corresponding to the cam 20 of Figure 1, are denoted by reference numerals 124, 126, 128 and 130 respectively.

The lost motion free pivot points corresponding to the rear pin 36, 38 of Figure 3 are denoted by reference

numerals 132, 134, 136 and 138 respectively.

Springs corresponding to the spring 40 of Figure 3 are shown at 140, 142, 144 and 146.

The cams 124 to 130 are all mounted on a common shaft 148 and drive therefor is derived therefrom a motor and gearbox assembly (not shown) similar to the item 16 of Figure 1.

Figure 9 illustrates the assembly of Figure 8 from the front as an elevation thereof in the direction of arrow 8.

Print head 114 and 112 are each an ink-loaded porous rubber stamp having a printface 115 and 113 respectively containing characters or indicia which when urged into contact with a sheet of paper such as the outside of an envelope or packet will produce a pattern of information thereon.

The print heads 110 and 108 respectively are constructed basically in the same way as the head shown in Figures 1 to 7 in that they comprise a series of endless belts (see Figure 11) of which one is designated 148 which have outwardly protruding segments containing characters for printing. Each of the belts can be indexed by appropriate rotation of one or the other of two drive shafts 150 and 152 which are themselves driven by toothed wheels 154 and 156 respectively themselves driven by worm gears 158 and 160 respectively on the outward shafts of two motors 162 and 164.

The print head 110, however, is not motor-driven but is manually rotatable to adjust the print head characters and to this end two thumbwheels 166 and 168 are provided which have external serrations such as at 170 which engage appropriately toothed wheels 172 and 174 respectively. The toothed wheels just referred to serve to drive one or other of two short axles (not shown) to rotate one or other of the endless belts such as 176 and the endless belts are engaged by externally segmented indicator wheels of which one is designated at 178 each having external protrusions for engaging in the segments around the endless belt 176 so as to rotate therewith.

By providing one indicator wheel for each of the endless belts 176 etc, so the characters lined up in the printing station by adjustment of the four endless belts 176 etc can be displayed on the appropriate indicator wheels behind a window 180 provided in a front inclined wall of a housing 182 which covers the whole assembly.

The franking machine thus incorporates three different types of printing head within the overall assembly, two in which the printing plates are self-inked for life and two in which the endless belts are of a porous material and are replenished by ink from a reservoir such as at 184 (see Figure 10).

Figure 11 shows the layout of the various parts making up the overall assembly at least insofar as the print head 108 is concerned. To this end there is a yoke 116 and spring 140, operating cam 124 on shaft 148 and a stop shaft 186 (not shown in Figure 8) extends across and prevents upward movement of the yoke assembly 116 beyond a certain amount under the action of the spring 140.

The encoder assembly 188 corresponds to the encoder cards 100 of Figures 1 to 7 embodiment and shown diagrammatically at 190 is one of the toothed wheels containing the electrical conductors which set up the contacts and circuits on the encoder boards and which rotates with rotation of the endless belt 148.

Below the printing stage is shown a soft resiliently deformable pad 192 to absorb unevenness and thick contents of envelopes and packets. A stop 194 running along the length of the base 196 behind the platen area 192 serves as a guide as to where the envelope, packet or the like should be pushed before the printing head is lowered.

Figures 12 and 13 illustrate a uni-directional clutch arrangement in which a shaft 196 has secured therein a diametrically extending dog 198 for engaging the inside of an annulus 200 which is formed as a circular internal ratchet. The dog 198 is slidable axially within the shaft 196. As the shaft 196 rotates in the direction of the arrow 202, drive is transmitted between the end 204 of the dog 198 and one of the teeth of the ratchet. Rotation of the shaft 196 in the opposite direction to arrow 202 causes the dog to ride up the inclined surface 206 and to enter the cutaway region 208 on the opposite side of the ratchet wheel so that there is no tendency for any rotational drive to occur between the shaft 196 and the internal ratchet wheel 200.

Figure 14 shows more clearly than the views of Figures 1 - 7 the internal detail of the printing head 26. The shafts 80, 82 are formed with reduced axially parallel grooves at their inboard ends one of which is shown in the cross-

sectioned half view of Figure 14, at 210. Rolling elements such as 212 are located in the grooves and support an annular member such as at 214 forming part of one of the driving wheels 78. The design of the grooves and rolling elements and shape of the interior of the annular member 214 is such that rotation of the shaft in one direction transmits drive to the driving wheel 78' whilst in the other direction, to the driving wheel 78". Endless bands containing printing characters are fitted arround the driving wheels 78 as previously described.

An electrical position-indicating signal is obtained from the rotation of the indexing wheel 94 co-operating with the driving wheel 78', 78" etc. In the view shown in Figure 14 indexing wheel 94' co-operates with driving wheel 78'. On the lefthand side in Figure 14 the indexing wheels etc are shown in cross-section and the sliding electrical contact between the wheel and the conductive tracks on its associated card 100'. However, in the non-section half of Figure 14 there can clearly be seen at 216 and 218. The indexing wheels 94', 94" etc are freely rotatable above their central supporting axle 220 whilst the cards are non-rotatable relative thereto.

Figure 15 demonstrates how, after removing the coverplate 52 (shown in Figure 7) the underside of the printing head 26 can be clearly seen to permit the semi-permanent printing matter to be changed if required. This is shown as the rectangular cross-hatched region 222 defining the aperture 224 through which the variable printing characters protrude. The region 222 is held in place by six screws 226 and is replaceable by other surrounds as required by removing the screws 226.

Claims.

1. A franking machine containing a printing head which itself includes at least one print face on the underside thereof which, when inked, will form an impression on the surface of an envelope or packet placed on the platen, wherein the printing head is pivotally attached to an arm with the axis of pivoting parallel to and closely spaced from the plane containing the print face (or lies in the plane containing the print face) so as to reduce sliding movement of the print face relative to an envelope or packet during downward movement of the printing head, the arm is connected to the remainder of the franking machine through a joint which permits at least limited relative movement between the arm and the machine in a plane through the joint and the printing head and in a plane at right angles thereto, a non-gravitational centering device resiliently holds the printing head in a fixed orientation relative to the arm and a thrust means is provided for exerting a thrust on the arm in a direction and at a position relative to the joint between the arm and the remainder of the franking machine, to urge the end of the arm carrying the printing head in a generally downward direction towards the platen during a printing operation.

2. A franking machine as claimed in claim 1 where the arm is normally held in an elevated position relative to the platen under the action of a spring or other resilient device and is urged thereby against a stop means determining the said elevated position.

3. A franking machine as claimed in claim 1 or 2 wherein a freely pivoting connection between the print head support arm and the remainder of the franking machine, is provided so providing further degree of freedom to the print face.

4. A franking machine as claimed in any of claims 1 to 3 wherein the downward force on the arm is provided by means of a cam which rotates through an over centre position to depress the arm towards the platen.

5. A franking machine as claimed in any of claims 1 to 4 wherein the arm is in the form of a yoke having two extensions which fit one on either side of the print head and provide two mounting points for stub-axles to permit the printing head to be pivotally attached to the yoke.

6. A franking machine as claimed in any of claims 1 to 5 wherein the freely pivoting connection at the rear of the arm or yoke comprises a lost motion connection in a vertical sense and the rear of the arm is capable of being pushed in downward direction through a small distance from its normal position where it engages the head of the retaining member under the action of the spring means aforementioned so that the force exerted between the print face and the surface of an envelope or packet to be impressed can be maintained constant, equal to the spring rate of the spring means acting on the arm.

7. A franking machine as claimed in claim 5 or 6 wherein the cam acting on the yoke is carried by an axle which extends parallel to the axis of pivoting between the print head and the arms of the yoke and the latter include upturned sidecheeks which are adapted to engage the underside of the axle carrying the cam when the yoke is in its elevated position relative to the platen.

8. A franking machine as claimed in claim 7 wherein a second axle or rod extends parallel to the first mentioned axle to the rear thereof and the spring means is attached at one end to the second mentioned rod or axle and at its lower end to the yoke.

9. A franking machine as claimed in claim 8 wherein the spring point of attachment, point of contact between the

cam and yoke and rear lost motion connection between the yoke and the baseplate all lie on the same straight line which itself is generally perpendicular to the axis of pivoting of the printing head relative to the yoke.

10. A franking machine as claimed in either of claims 8 or 9 wherein a second cam is located on the axle containing the first mentioned cam and a microswitch is provided operated by rotation of the second mentioned cam so as to indicate when the axle containing the first mentioned cam occupies a given angular position corresponding to the home position of the yoke.

11. A franking machine as claimed in any of the preceding claims wherein the printing head includes means for adjusting at least some of the characters and information contained in the print face to permit variation of postal value and date.

12. A franking machine as claimed in any of the preceding claims wherein means is provided within the printing head for generating electrical signals indicative of the selected postal value and/or date to permit remote indication of the selected values and date.

13. A franking machine as claimed in any of the preceding claims wherein drive means for altering the characters and data in the print face is also carried by the printing head.

14. A franking machine as claimed in any of the preceding claims wherein inking means is contained within or on the printing head to cause the print face to be inked sufficiently often to ensure that a good impression is

always obtained however many times the printing head is operated.

15. A franking machine as claimed in any of the preceding claims 8 to 14 wherein the printing head and associated yoke form a sub-assembly which is duplicated along the print path so that two or more independent printing heads can be provided within the same franking machine, one dedicated to printing the postal value information, another dedicated to printing the date and town and a third optional sub-assembly dedicated to printing advertising material or other promotional material as part of the franking of the envelope.

16. A franking machine as claimed in claim 15 wherein a common drive means in the form of a single axle having separate cams operating on each of the yokes for the different sub-assemblies is provided so that a single drive can be used to actuate all three print heads simultaneously.

17. A franking machine as claimed in any of claims 8 to 16 wherein the non-gravitational centering device for maintaining a constant orientation of the printing head relative to the yoke or arm comprises a spring, typically a coil spring, having two radiating arms, one attached to the yoke and the other to the printing head so that tilting of the printing head about the axis of pivoting between it and the yoke in either direction of rotation about the said axis will be resisted by the spring so that the latter will always return the printing head to a constant position relative to the yoke after a printing operation which has caused the head to be tilted about the axis of pivoting between it and the yoke.

18. A franking machine as claimed in claim 1 constructed arranged and adapted to operate substantially as herein described with reference to and as illustrated in the accompanying drawings.

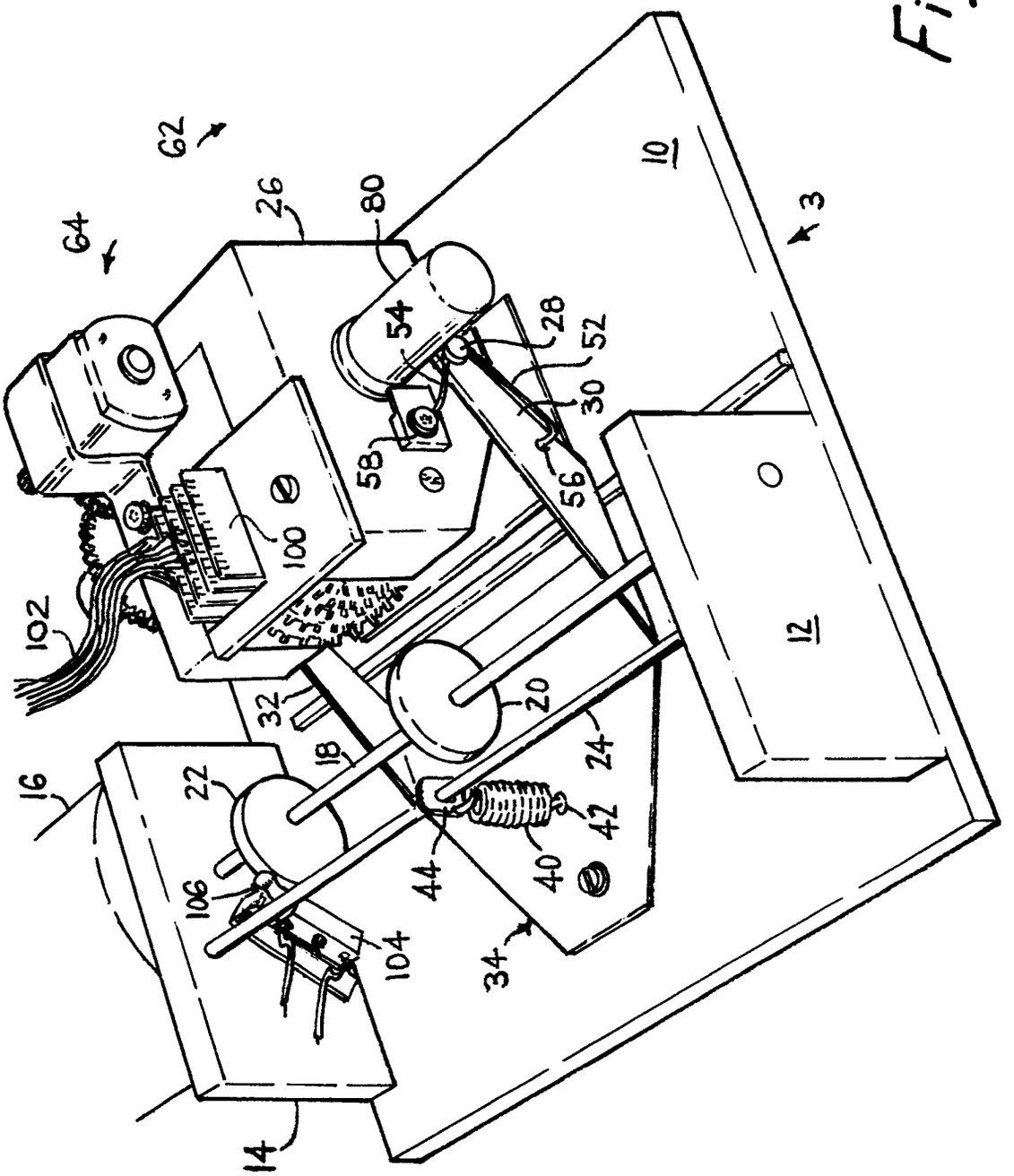
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Fig. 1

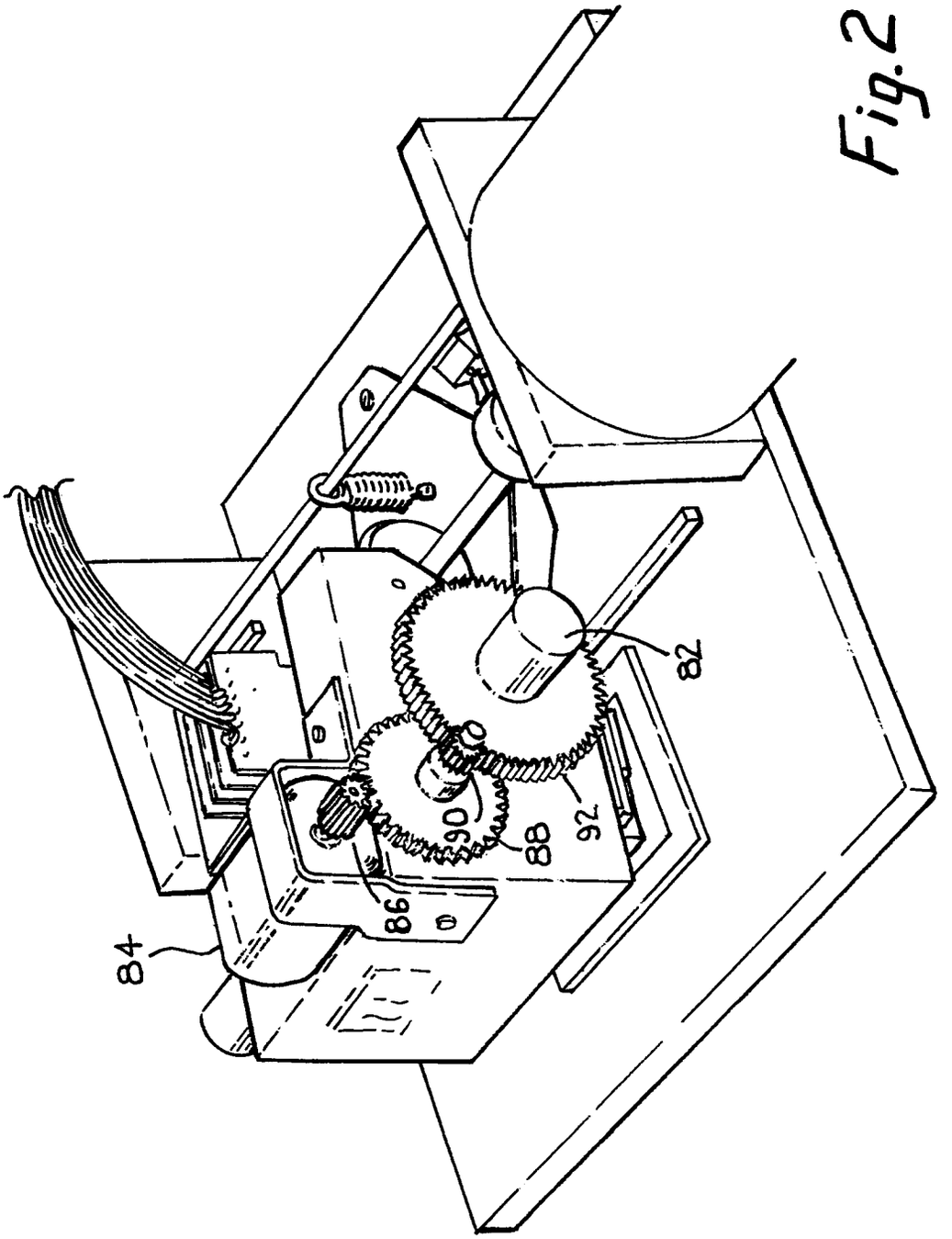


Fig.2

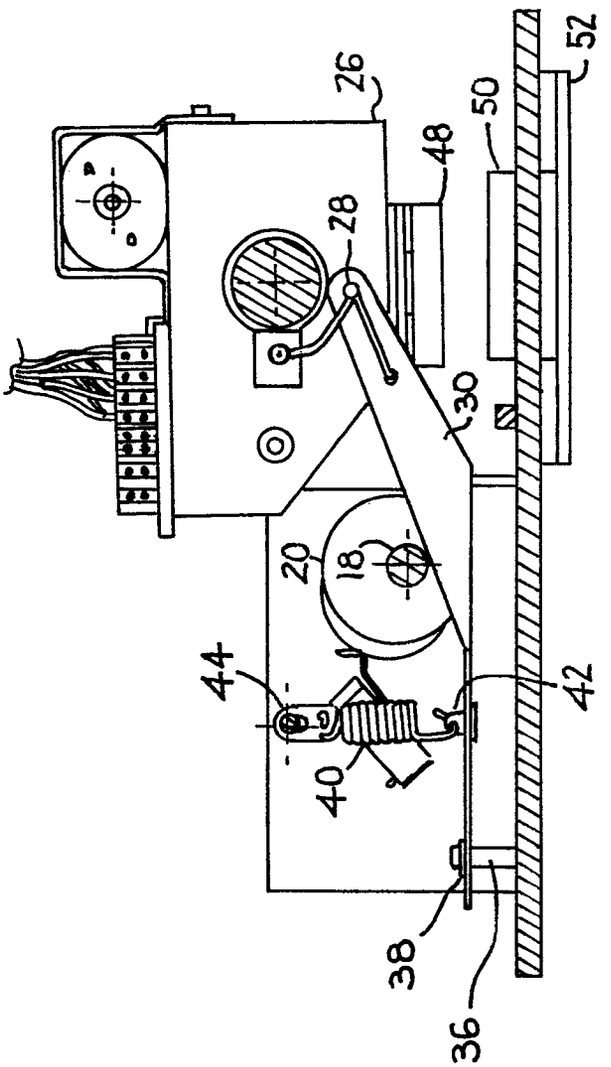


Fig.3

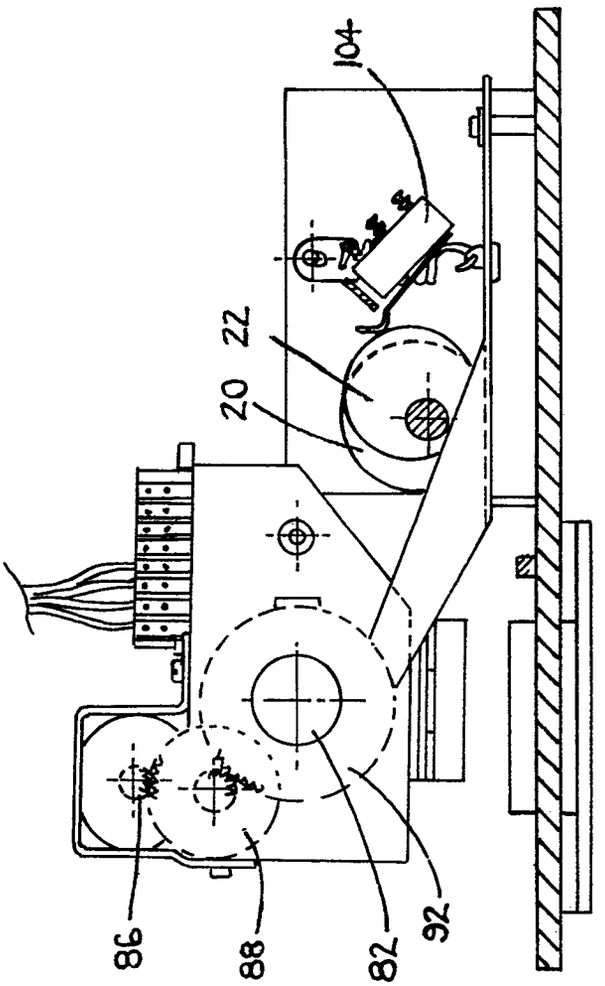


Fig. 4

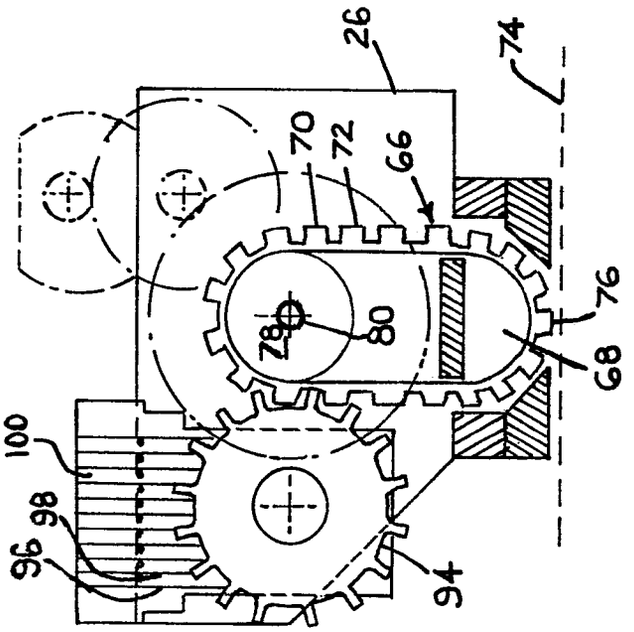


Fig.5

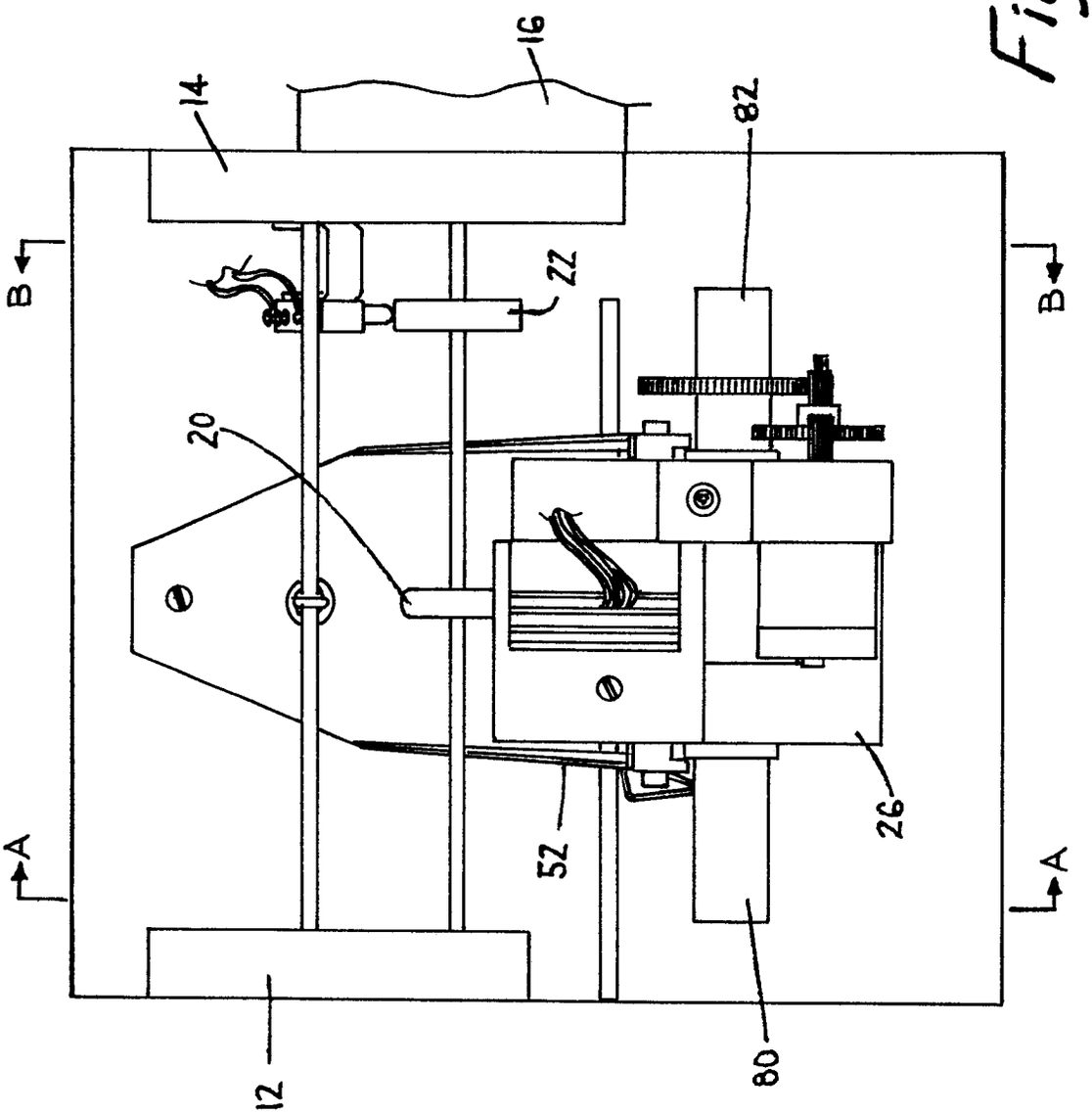


Fig.6

Fig.7

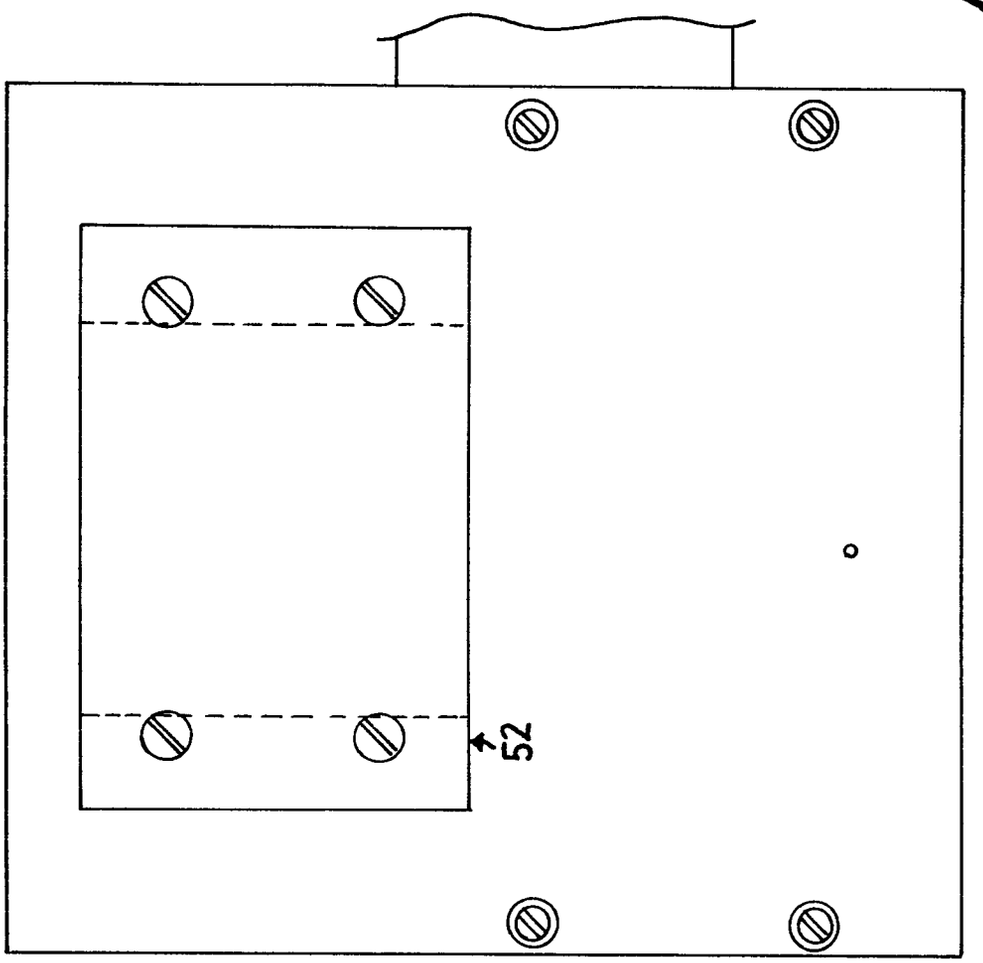
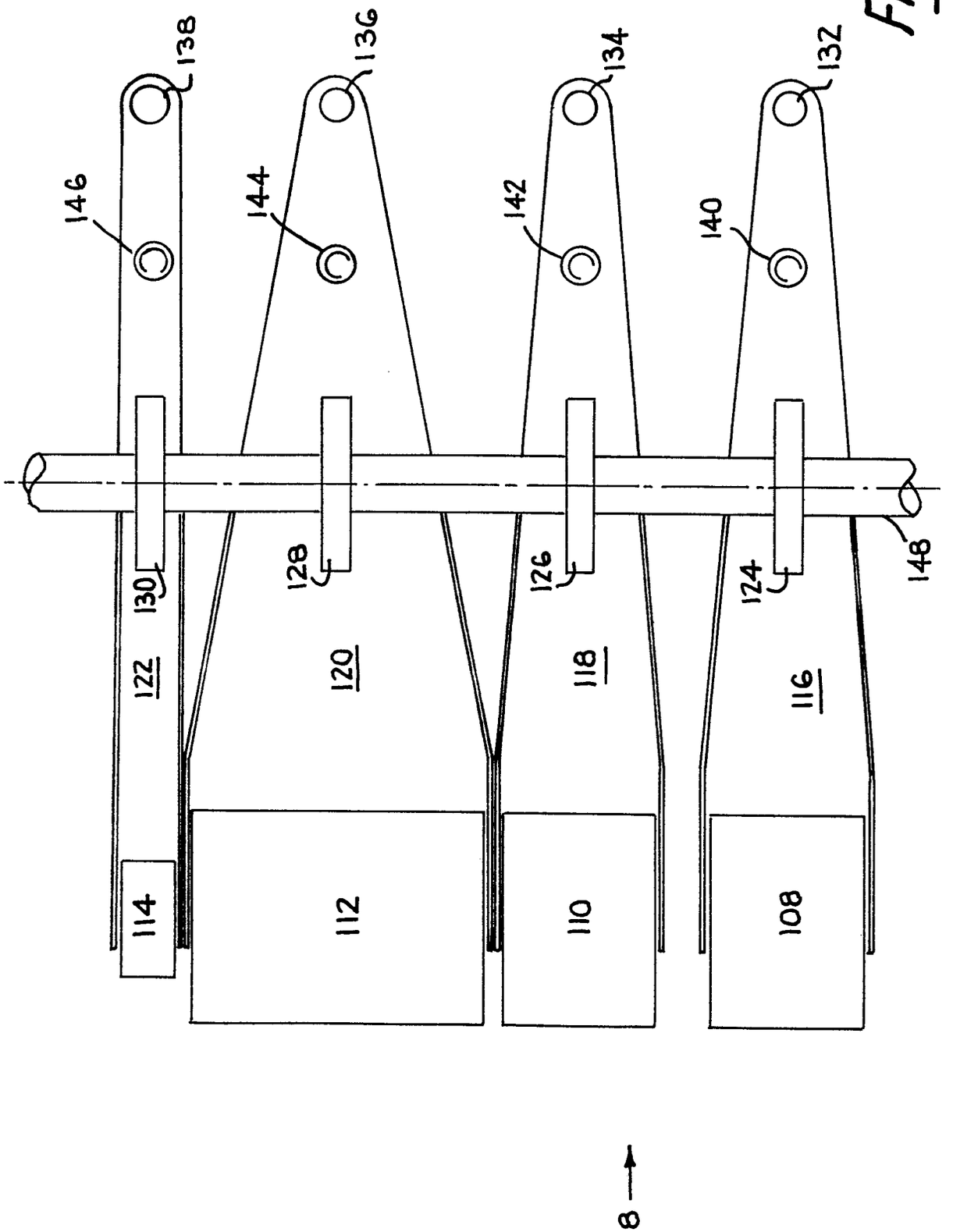


Fig.8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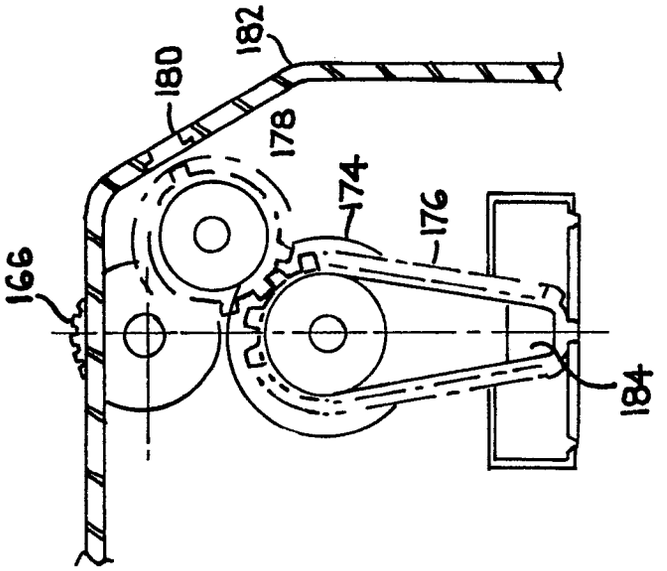

Fig.10

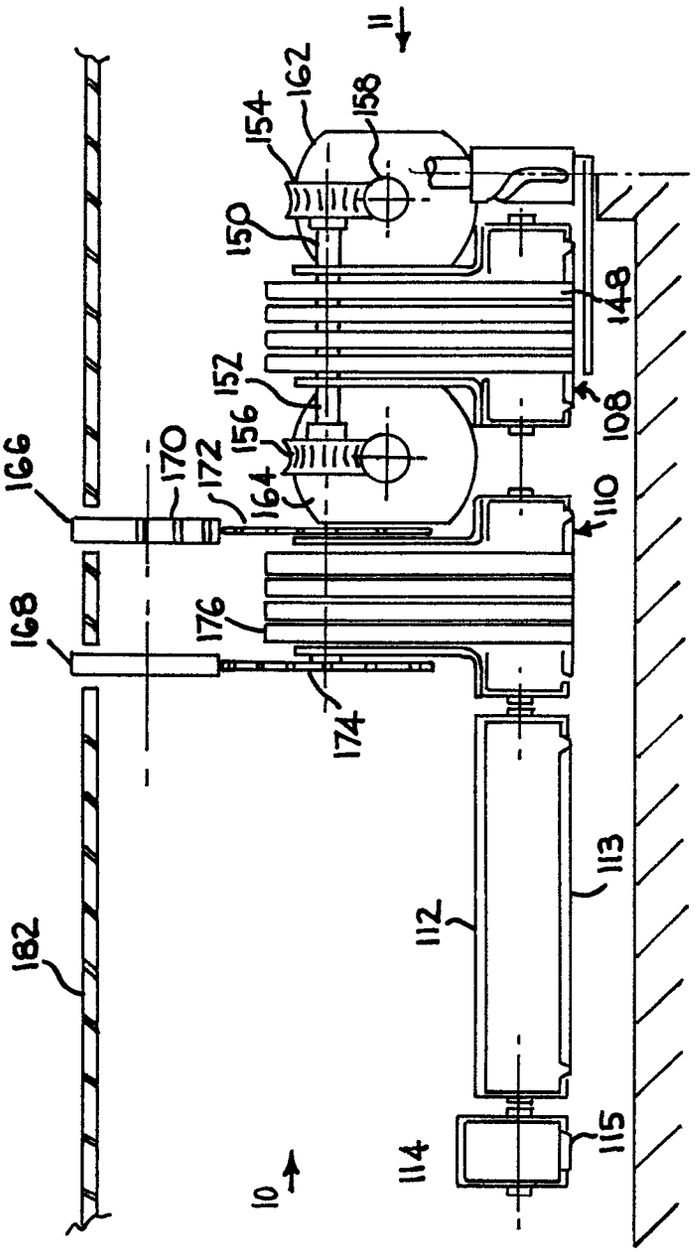

Fig.9

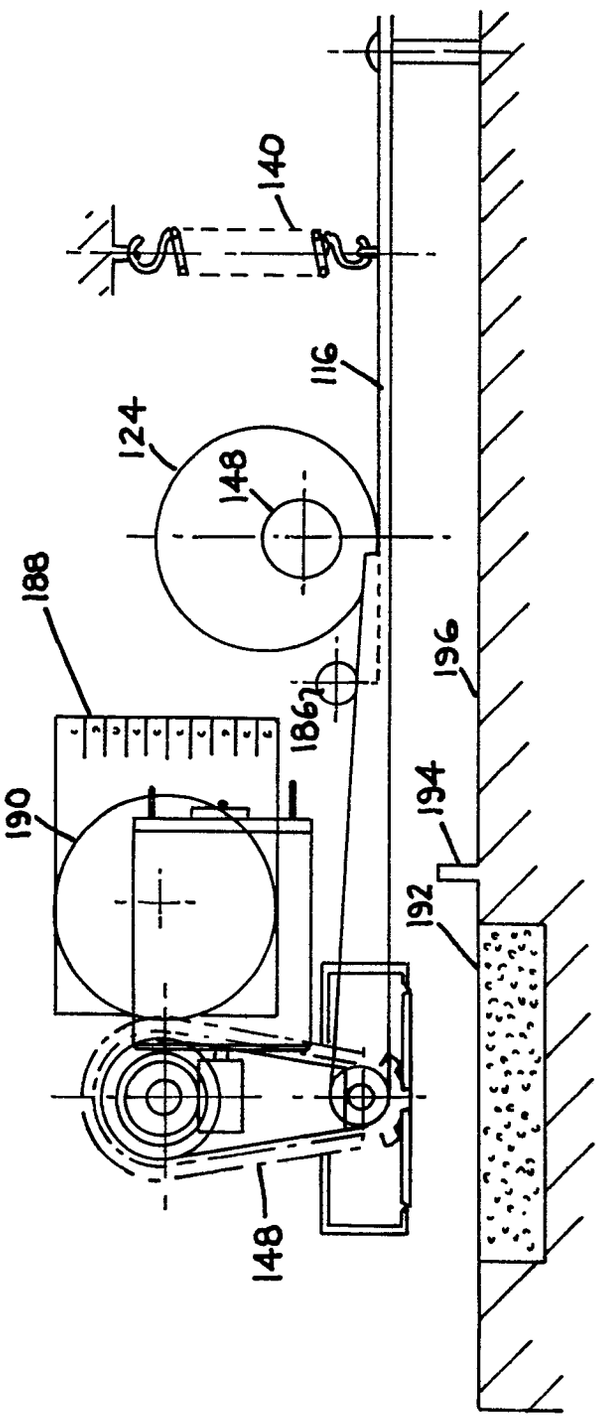

Fig. 11

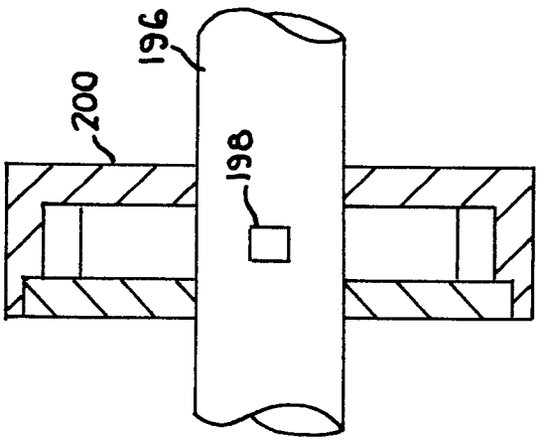

Fig. 13

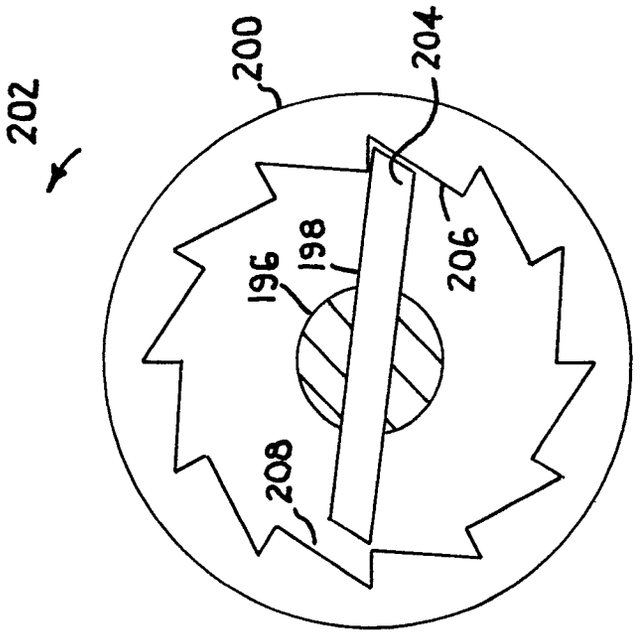

Fig. 12

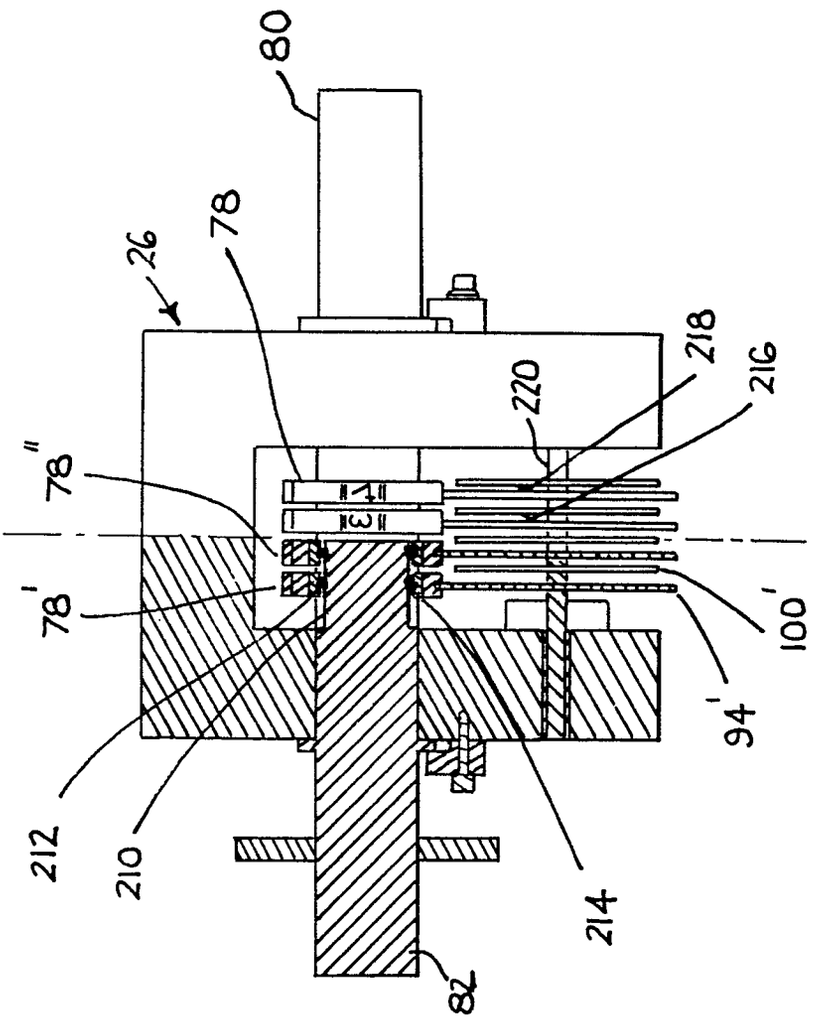

Fig. 14

Fig. 15