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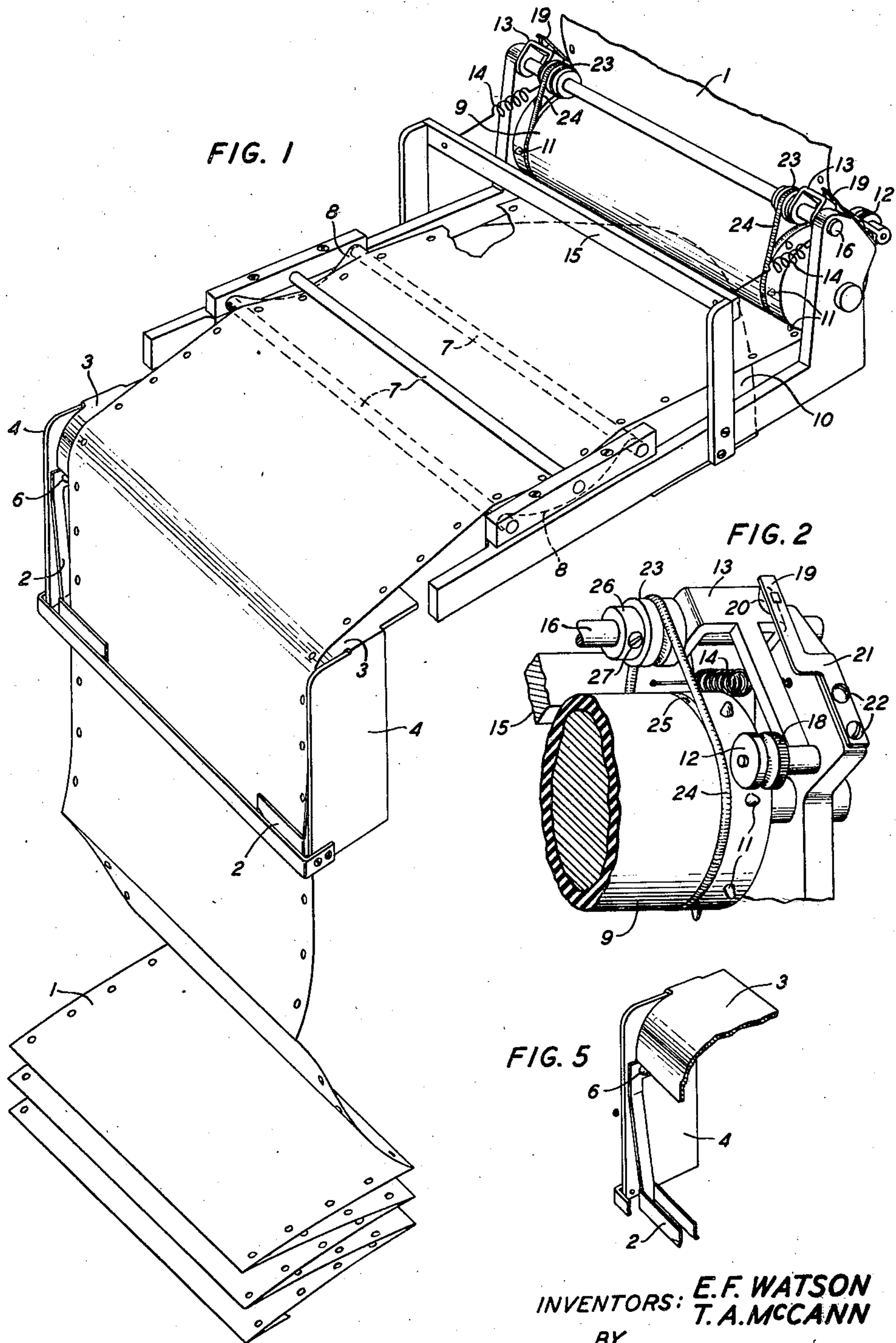
E. F. WATSON ET AL

1,983,586

PAPER FEED MECHANISM

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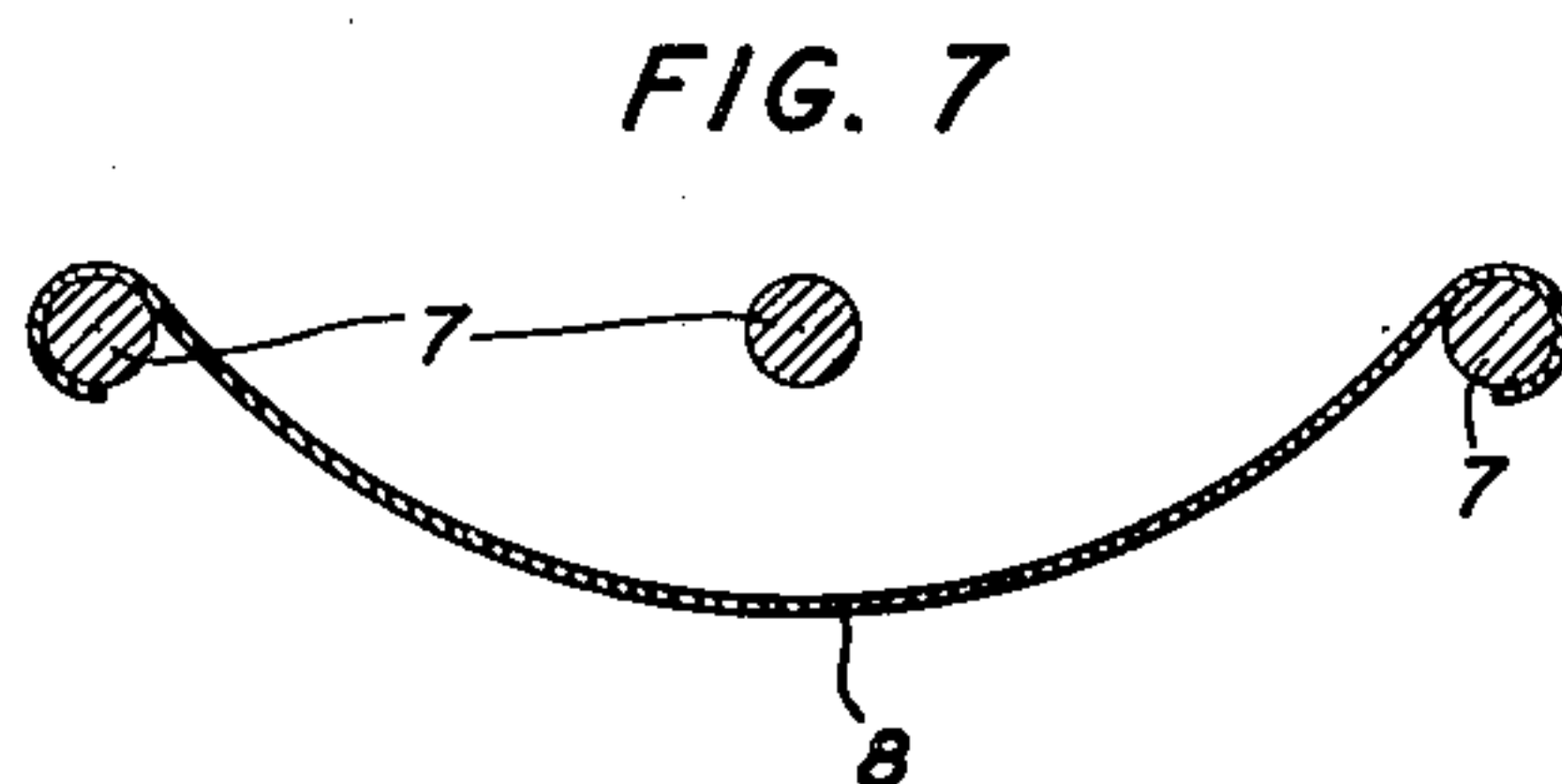
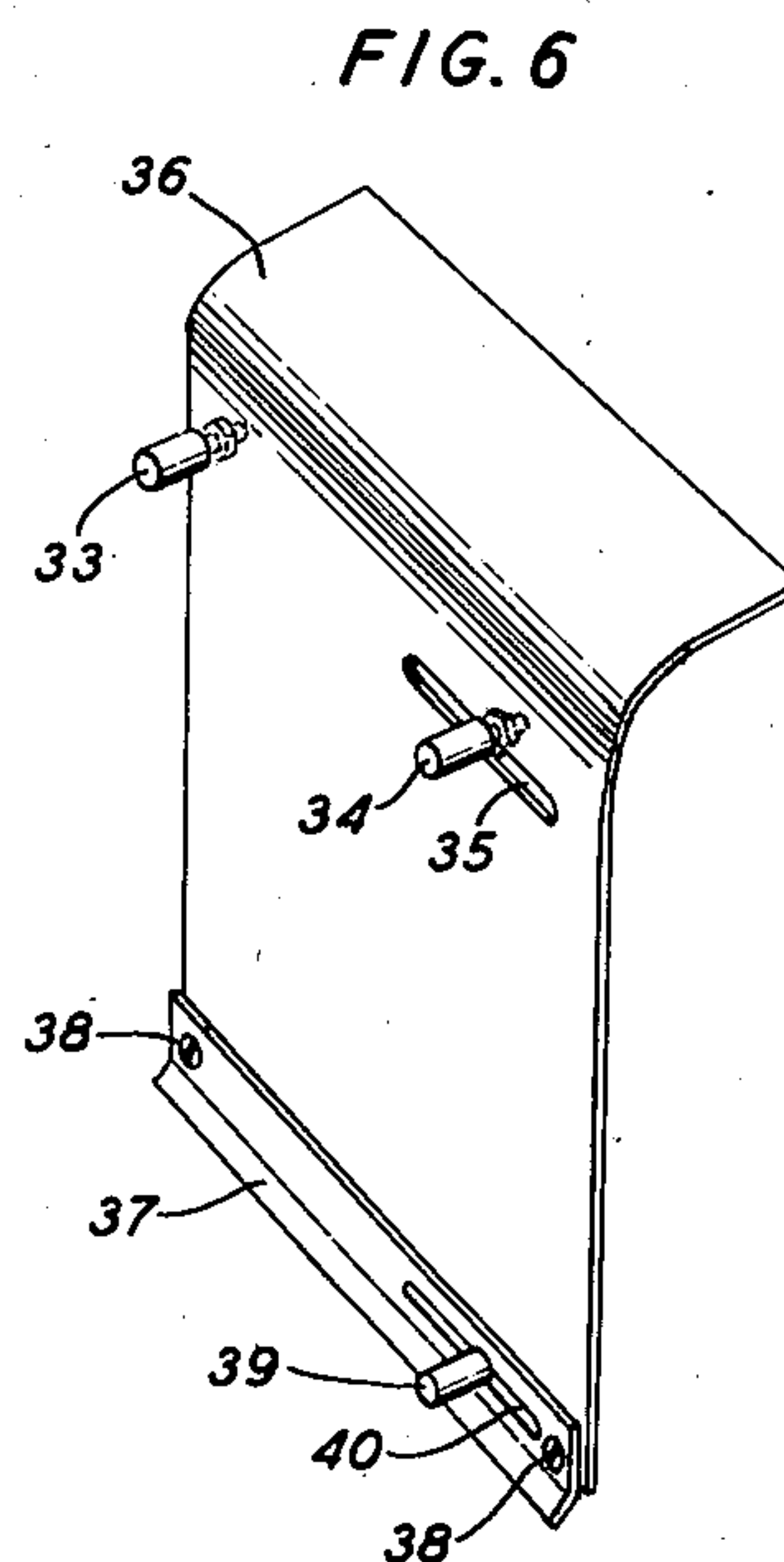
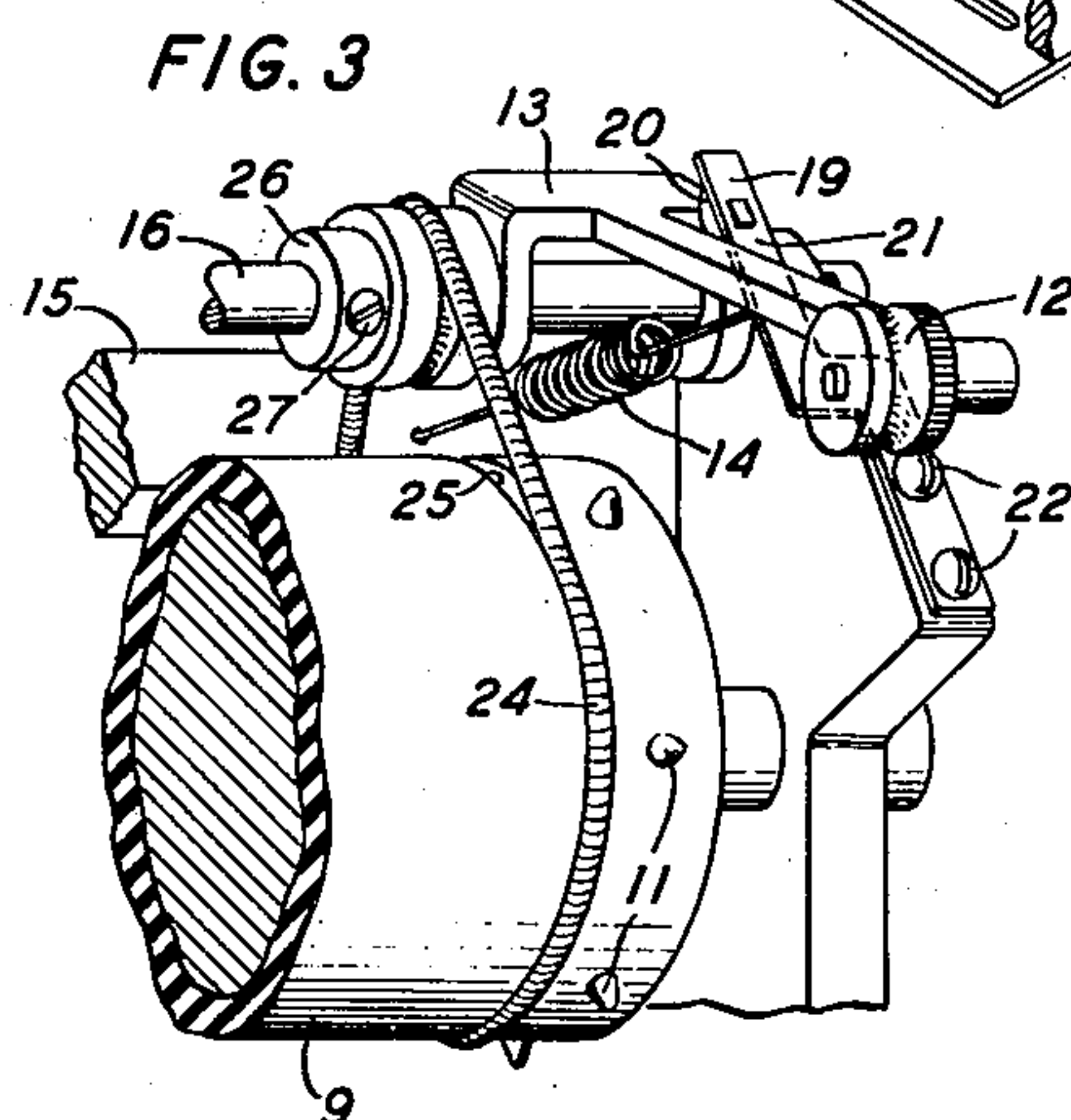
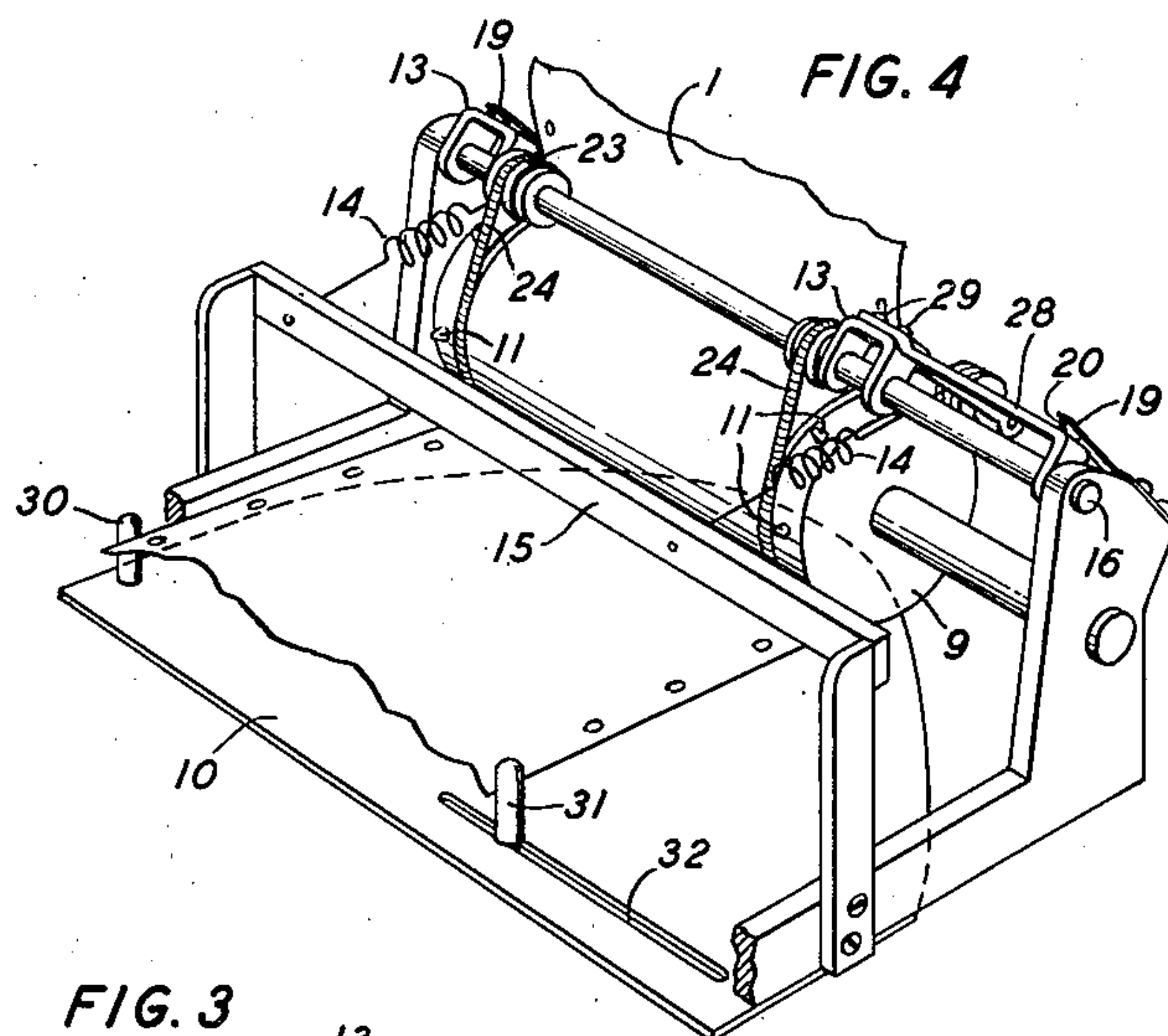
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PAPER FEED MECHANISM

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INVENTORS: **E. F. WATSON**
T. A. MCCANN
BY 
ATTORNEY

UNITED STATES PATENT OFFICE

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PAPER FEED MECHANISM

Edward F. Watson, Larchmont, N. Y., and Thomas
A. McCann, East Orange, N. J., assignors to
American Telephone and Telegraph Company,
a corporation of New York

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7 Claims. (Cl. 197—133)

This invention relates to a method of and mechanism for feeding stationery through a printing machine, particularly stationery of the type which has a series of perforations therein for sprocket wheel advancement.

An object of this invention is to provide a sprocket feed arrangement for feeding stationery through a printing machine in an efficient and convenient manner.

A feature of this invention resides in the novel belt arrangement for guiding the paper away from the platen and out of the printer.

A further feature is the paper aligning means for prealigning the paper laterally before it is carried into the printer.

Still another feature is the special rod construction which functions to exert a retarding effect on the paper as it is moved forward during a line feed.

One advantage of this invention is that the paper may be severed from the web within a very short distance of the printing point on the platen.

Another advantage is that all printed portions of the paper are disclosed to the observer at all times.

A further advantage resides in the easy and convenient manner in which the machine can be loaded with paper forms.

Briefly this invention comprises paper feed mechanism of the sprocket wheel type for feeding multicopy stationery through a printing telegraph machine. The multicopy stationery enters the printer through the rear of the machine over a smooth quadrant surface. Immediately below the quadrant surface suitable aligning means, such as resilient aligning fingers, may be placed for prealigning the stationery laterally as it is fed into the machine. After passing over the quadrant surface, the paper is woven through a plurality of retarding rods which tend to produce a longitudinal friction on the individual sheets of the multicopy stationery as they are pulled into the machine by the line feed operation of the platen. This longitudinal friction tends to hold the paper firmly around the surface of the platen, and appreciably retards the forward motion of the paper only during a line-feed operation. Between line feeds the paper is free to adjust itself.

After the paper passes the printing point on the platen, it is pressed firmly to the platen by small pressure rollers on each end of the platen. These rollers are located as near the printing point as possible and are designed to press the paper on both sides of the sprocket pins. With this arrangement no tearing edge is required, the paper

forms being perforated at places where it is desired to sever the web. The severing of the web may be effected by the operator exerting a sudden pull on the paper at any time after the perforated line has passed the pressure rollers. This pull should be made in a direction substantially parallel to the direction of motion of the paper as it leaves the platen. This construction enables the paper to be separated from the web less than half an inch from the bottom of the first printed line.

Carrier belts, constructed of coil springs, guide the paper away from the platen and out of the printer through the cover of the machine. These belts, one at each end of the platen, ride in grooves in the platen and are supported by idler pulleys located on a shaft above and slightly to the rear of the platen.

Referring to the drawings, Figure 1 shows the paper feed mechanism comprising this invention along with the cooperating portions of a printer machine.

Figs. 2 and 3 show, in detail, the carrier belt and pressure roller assemblage at one end of the platen. It is understood of course that a similar arrangement is provided at the other end of the platen.

Fig. 4 illustrates a modification which may be employed for feeding paper forms of different widths through the printer machine.

Fig. 5 shows one end of the paper aligning means for prealigning the paper laterally before it is carried into the printer. It is understood of course that the other end is similarly constructed.

Fig. 6 shows a modification of the paper aligning means for prealigning the paper laterally.

Fig. 7 shows a side view of the three retarding rods with the baffle plate attachment.

Referring to Fig. 1, a supply of multicopy paper 1 is shown arranged to be fed through a printer machine. This paper is aligned laterally prior to entering the printer machine by resilient metallic fingers 2, 2 which provide a free movement and easy passageway for the paper. These fingers serve to align the paper laterally and check the movement of the paper from one side to the other. Immediately above fingers 2, 2 is a quadrant surface 3 over which the paper passes before entering the printer. Fingers 2, 2 and the quadrant surface 3 are connected together to form one complete element by means of vertical supports 4, 4 to which the fingers are joined by screws 6.

Upon entering the printer machine the paper is woven through three parallel rods 7 attached to the framework of the machine in any suitable

manner and arranged transversely to the direction of motion of the paper. These rods retard the forward motion of the paper during a line-feed operation only so as to prevent the paper from becoming disengaged from the sprocket pins. At times between line-feeds the paper is loose about the rods.

An advantage of this retarding arrangement is that the rods do not bind the paper so as to prevent lateral movement. Thus the individual sheets are free for lateral alignment by means of the guides 2. The outer rods are joined by a baffle plate 8 which serves to prevent the paper from being incorrectly woven through the retarding rods during the loading of the printer machine. Between the retarding rods 7 and the platen 9 of the machine is a flat metallic loading plate 10 which is curved slightly toward the platen. This plate is supported by the printer framework below the platen extending slightly to the front and to the rear of the platen and assists in loading the machine.

The platen 9 is provided with a row of projecting sprocket pins 11 circumferentially arranged around the platen at both ends to cooperate with the perforations in the paper for advancing the paper over the platen during the line-feed operation (Figs. 2 and 3). It is to be understood of course that these pins may be part and parcel of the platen or may form part of a separate sprocket wheel arrangement attached to the platen. Straddling the sprocket pins 11 and exerting a pressure on the platen are pressure rollers 12 which are supported by shoulder arms 13 mounted on shaft 16. These rollers touch the platen at points which are on the same horizontal level as the printing point and are designed to press the paper on both sides of the sprocket pins. A knurled edge 18 provides the rollers with a firm grip on the paper.

Affixed to each shoulder arm 13 is a spring 14 which is connected to a bar 15 located in the rear of the platen. These springs pull upon the arms 13 thereby causing rollers 12 to press upon the paper on the platen. Shoulder arms 13 are mounted upon shaft 16 in such manner as to be capable of rotation upon the shaft. These arms may be lifted during the loading operation to permit placing the paper forms in engagement with the sprocket pins on the platen. A catch 19 individual to each shoulder arm and normally resting upon the shoulder is provided for holding the arm in a raised position whenever the pressure rollers 12 are lifted during this loading operation (Fig. 3). This catch comprises a rounded metallic plate 20 affixed to a support 21 which is screwed to the framework of the printer by means of screws 22. Catch 19 may be released and the pressure roller snapped back into place by exerting pressure either upon the shoulder arm 13 or upon roller 12. This will restore catch 19 to its normal position on the shoulder 13.

The rollers 12, which bear with considerable pressure against the platen, by their cooperation with the retarding arrangement including the rods 7, make it possible to dispense with any guide mechanism for loosely holding the sheets against the platen. The described arrangement holds the sheets tightly against the surface of the platen and no attempt is made to longitudinally align the sheets after they have engaged the pins on the platen. The sheets are longitudinally aligned once and for all as soon as one of the holes engages the first feed pin on the platen. When the sheets are partially wrapped about the platen,

by simultaneously engaging several feed pins they are locked in their aligned condition and cannot get out of alignment thereafter.

Mounted on shaft 16 above and slightly to the rear of the platen 9 are idler pulleys 23 individual to each end of the platen for supporting endless carrier belts 24. These belts are arranged to ride in grooves 25 in the platen 9 and serve to guide the paper away from the platen and clear of the printer mechanism within the cover. Although the carrier belts used in the preferred form of this invention are constructed of coil springs joined by small eyelets it is to be understood that any suitable material may be used to form the carrier belts. In order to prevent idler pulleys 23 and shoulder arms 13, which are mounted on shaft 16, from moving away from their proper position and sliding along the shaft, metallic washers 26 are provided which are individual to each end of the shaft. These washers are fastened to shaft 16 by means of screws 27.

Referring to Fig. 4, a modification is illustrated which may be utilized when it is desirable to feed paper of different widths through the printer machine. This arrangement is similar to that shown in Fig. 1 except that the platen is shorter in order to permit the sprocket pins to engage the perforations in the smaller size paper. An extension arm 28 is also provided at one end of the carriage to hold the left shoulder arm 13 and left pressure roller 12 in proper relation to the sprocket pins. Extension arm 28 is supported on shaft 16 and is fastened to the left shoulder arm 13 by means of screws 29.

In Fig. 4 the flat loading plate 10 is shown provided with aligning fasteners 30 and 31 for assisting in the lateral alignment of the paper. Fastener 30 is stationary and may be attached to loading plate 10 in any suitable manner, for example, by a nut affixed to the fastener on the bottom side of plate 10. Fastener 31 is adjustable and may be moved horizontally in a slit 32 in loading plate 10 to conform with the width of the paper used by the printer machine.

Fig. 6 is a modification of the paper aligning means of Fig. 5 and is used to align the paper laterally prior to its entering the printer machine. This modification may be employed with the arrangement of Fig. 4. Stationary fastener 33 and adjustable fastener 34 riding in slit 35 serve to align the paper laterally before it passes over quadrant surface 36 in a manner similar to that hereinbefore described in connection with fasteners 30 and 31 of loading plate 10. A passageway permitting free movement of the paper is provided between plate 36 and a metallic strip 37. Strip 37 is fastened to plate 36 at both ends by screws 38, 38. A narrow opening 40 in plate 36 and strip 37 permits the movement of an adjustable fastener 39 for assisting in the lateral alignment of paper of different widths.

Fig. 7 is a side view of the retarding rod arrangement and shows the manner in which the baffle plate 8 is attached to the outer rods 7.

The loading of the printer machine is effected by passing the paper between the prealigning guides 2, 2 or 33, 34, weaving the paper through the retarding rods 7, then advancing the paper forward over the flat loading plate 10 until it reaches the front of the platen 9. The pressure rollers 12, 12 may then be lifted vertically and supported by the small catch arrangements 19, 19 so as not to interfere with the loading operation while the paper is set on the sprocket pins 11. The pressure rollers 12, 12 are then snapped back

into place leaving the printer machine ready for printing.

Although several specific embodiments have been described it is to be understood that various modifications may be made in the form and arrangement of the different parts comprising this invention without departing from the scope of this invention.

What is claimed is:

10 1. Mechanism for aligning paper for passage through a printing machine comprising a support over which the paper passes in direct contact therewith, at least one element affixed to each side of said support for guiding the paper, 15 said support being adapted to provide a free passageway for movement of the paper between said elements, said elements being resiliently mounted on said support in such manner as to keep the paper in proper lateral alignment.

20 2. Apparatus for aligning paper for passage through a printer machine comprising a plurality of fingers for aligning the paper laterally, a supporting quadrant surface over which the paper passes prior to entering into the printer machine, and a support for said fingers adapted 25 to provide a passageway between the fingers on each side of the apparatus suitable for the proper feeding of the paper, said fingers mounted on said support so as to be capable of resilient lateral motion.

30 3. A printer machine having in combination paper feed mechanism comprising a platen with projections circumferentially arranged at each end of said platen for feeding the paper through the printer machine, carrier belts and pressure 35 rollers associated with said platen, said carrier belts being arranged to ride in grooves in said platen for guiding the paper away from said platen, and said pressure rollers being adapted to exert a pressure on said platen on both sides 40 of said projections.

45 4. For use in feeding paper through a printing machine, a device to retard the feeding of said paper, said device comprising a plurality of spaced parallel members positioned transversely to the direction of feeding of said paper, and a curved surface in combination therewith to facilitate the

initial passage of said paper through said members, said device affording a path for passage of the paper, said path being of width greater than the width of said paper.

5 5. In combination with paper feeding means, instrumentalities to support and laterally align said paper, said instrumentalities comprising a smooth surface of width greater than the width of said paper, supports attached thereto, the distance between said supports being greater than 10 the width of said paper, and members on each side of said paper, mounted on said supports so as to be capable of resilient motion in a direction transverse to the direction of motion of said paper, said members loosely engaging the edges of 15 said paper and laterally aligning said paper.

6. In combination in a printer machine adapted to print on stationery having longitudinal perforations therein, a platen having sprockets thereon for feeding the stationery through the 20 machine by co-acting with the perforations in the stationery, and instrumentalities for stripping the stationery from the sprockets on the platen after the stationery has passed the printing point of the platen, said instrumentalities including a grooved pulley located on a shaft just 25 above the platen, a circumferential groove in the platen near the sprockets, and an endless belt passing around the circumferential groove in the platen and the groove in the pulley. 30

7. A printing machine for printing upon paper, said machine having in combination paper feed mechanism and instrumentalities for producing a 35 retarding effect on the paper, said instrumentalities including three parallel members arranged transversely to the direction of motion of the paper and through which the paper is woven, said parallel members affording a path for passage of the paper, said path being of width greater 40 than the width of the paper, and a supporting member for holding the outer two of said parallel members in a certain position with respect to the middle parallel member for enabling the paper to be more easily woven through said parallel members. 45

EDWARD F. WATSON.
THOMAS A. McCANN.