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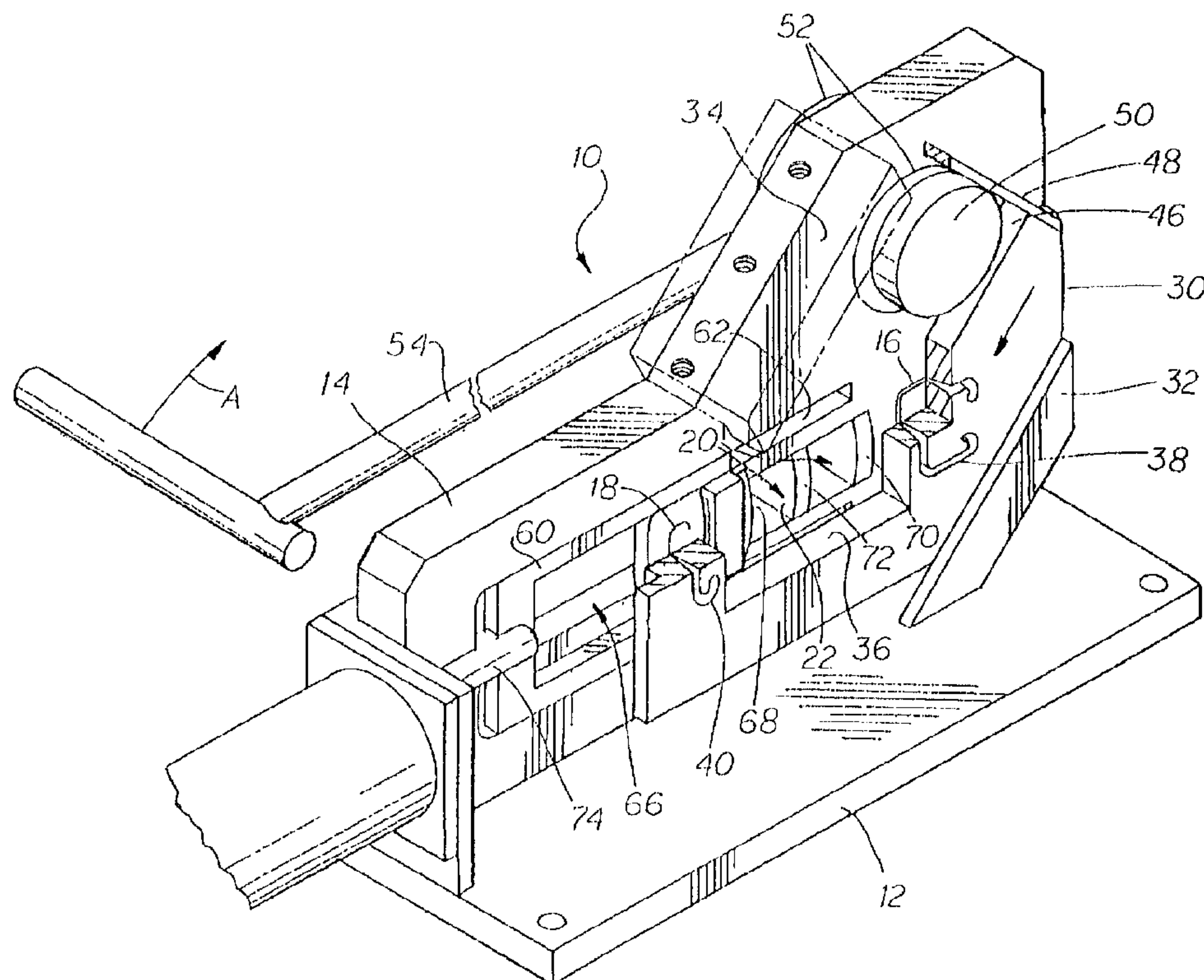
(72) Inventeur/Inventor:
MAROCCO, NORBERT, CA

(73) Propriétaire/Owner:
SHADE-O-MATIC LIMITED, CA

(74) Agent: GIERCZAK, EUGENE J. A.

(54) Titre : APPAREIL POUR COUPER LES BOUTS ET METHODE DE DECOUPAGE

(54) Title: END TRIMMING APPARATUS AND METHOD OF TRIMMING



(57) Abrégé/Abstract:

An apparatus for trimming the width of blinds of the type having a headrail, and a bottom rail and blind slats, and having supports with a headrail opening, and a bottom rail opening, and a blind slat opening, the blind components being insertable into their openings from one side of the support, a head rail cutter located adjacent to the support, and a bottom rail cutter, the cutters being moveable relative to the headrail and bottom rail openings, and a blind slat cutter moveable for cutting the blind slats. A modified apparatus can be used to trim the width of a vertical blind having a headrail and control rods. Also disclosed is a method of trimming blinds.

ABSTRACT OF THE DISCLOSURE

An apparatus for trimming the width of blinds of the type having a headrail, and a bottom rail and blind slats, and having supports with a headrail opening, and a bottom rail opening, and a blind slat opening, the blind components being insertable into their openings from one side of the support, a head rail cutter located adjacent to the support, and a bottom rail cutter, the cutters being moveable relative to the headrail and bottom rail openings, and a blind slat cutter moveable for cutting the blind slats. A modified apparatus can be used to trim the width of a vertical blind having a headrail and control rods.

Also disclosed is a method of trimming blinds.

FIELD OF THE INVENTION

The invention relates to an apparatus for cutting of the ends of a blind assembly, and to a method of trimming blinds.

BACKGROUND OF THE INVENTION

Venetian blinds having a headrail and blind slats extending horizontally across a window space are well known. It is well understood that the width of the headrail and the blinds must be suited to more or less match to the width of the window space.

For many years it has been the practice to manufacture venetian blinds on a custom basis. Each blind would be made with the width of the headrail, and the blade width corresponding to the width of a particular window for a particular customer.

This procedure is however relatively expensive. A salesperson is required to attend the customer's house, in most cases, and take a series of measurements. An order is then placed at the factory, and some weeks later the finished blinds are delivered to the customer. Clearly it would be desirable to manufacture a range of venetian blinds, which could be arranged to fit window spaces having a range of widths. However given the limitation of the design, this is simply not possible. In order to partly answer the problems of cost, and delay, of custom made venetian blinds, it would be desirable to manufacture venetian blinds in a range of stock widths, and in a limited range of colours, and stocking these blinds in retail outlets. A customer wishing to purchase a blind or blinds from such an outlet would simply come in with the measurements of the windows of the customer's house. The customer would select those blinds which were as close to the measurements as possible, or only slightly wider.

The retail store would then trim the ends of the blind to the width desired by the customer. The system would mean that the blinds could be manufactured in larger

production runs, thus reducing the cost. It would also mean that customers could purchase blinds and take them away from the store almost on a same day basis. There are however certain problems with this procedure.

In particular the design of venetian blinds requires at least two and in some cases more, raise cords, and tilt cords. These cords are arranged at equal distances from each side of the blind. Consequently, trimming the blind to width required trimming each side, by an amount equal to one half of the desired total trim amount, so as to ensure the blind had a satisfactory symmetrical appearance. However, the blind consists of three main different components namely, a headrail, usually of U-shaped metal channel, a bottom rail, and a set of blind slats, the number depending on the height of the window opening.

In the many cases the blind slats were formed with a curved cross-section, and the ends of the blind slats were usually cut with a slight bevel or radius, so as to avoid sharp corners at each end of each blind slat.

End trimming operations could not be carried out by simple hand tools. Specialized dies or blades were required for cutting each separate shape, i.e. for cutting the headrail and for cutting the bottom rail and for cutting the slat ends which were of arcuate cross-section with bevelled corners.

Specialized dies and tools have been provided for the purpose, but, it was necessary for each retail store to be carefully trained so as to carry out the three separate cutting operations in a way which produced a blind which was symmetrical down each side.

With this type of system however, there were possibilities for mistakes, and the operator required considerable skill. The cutting operation was also time consuming.

For all of these reasons, it is clearly desirable to provide an end cutting

apparatus for cutting the sides of venetian blinds, in which all three components namely, the headrail, the bottom rail and the blind slats are all cut in a single apparatus. In this way the time required in the retail store for the end cutting operation is reduced. In addition, the skill required is reduced since all three components are in a single plane.

Similar requirements may also arise in connection with vertical blinds. In this case the blind has a headrail, and control rods within the headrail. It may be advantageous to trim these components at the point of sale for example, in order to adjust the width of the blind to the requirements of a customer. There is in this case no bottom rail and the vertical slats have a predetermined height which is not trimmed. However, depending on the length of the headrail that is to be trimmed off, it may be necessary to remove one or more vertical blind slats, and runners, from the headrail.

BRIEF SUMMARY OF THE INVENTION

An apparatus for trimming the width of blinds of the type having a headrail, and a bottom rail, and a plurality of blind slats, each having a predetermined profile, and comprising, a support body means, said body defining a headrail opening, and a bottom rail opening, and blind slat opening means respective said blind components being insertable into respective said openings from one side of the body means, a headrail cutter, a bottom rail cutting recess and cutter, and a blind slat cutter, the cutters being movably mounted on the body means, and, means for moving the cutters.

The invention also provides that said headrail opening, said blind slat opening means, and said bottom rail opening in said support body are aligned along a common axis, and wherein said headrail cutter, and the blind slat cutter and said bottom rail cutting recess are also aligned along a common axis.

The invention also provides that said axes are coincident and are horizontal, whereby to facilitate insertion of respective said blind components in respective said openings and recesses and passages.

The invention also provides that the head rail cutter may be moveable along a movement axis which is substantially at an angle to said axes of said openings and said recesses.

The invention also provides that said blind slat opening means is adapted to receive said blind slats of a venetian blind, and wherein there is optionally a blind slat passage in said head rail cutter which is oversized relative to said blind slat opening means, whereby movement of said head rail cutter does not effect cutting of said blind slats.

The invention also provides a blind slat cutter blade movable relative to said blind slat opening means in said support body, whereby to cut said blind slats, upon movement of said blind slat cutter blade means.

The invention also provides blind slat support means defining a predetermined profile, and mounted on said support body and wherein said blind slat cutter blade means defines a corresponding predetermined profile, whereby said blind slats are trimmed in accordance with said predetermined profile.

The invention also provides partition means in said blind slat opening whereby said blind slats may be arranged in groups for cutting.

The invention also provides end stop means for engaging the free ends of said blind components, whereby to define a predetermined length of cut in respect thereof.

The invention also provides means for cutting the headrail and the control rods of a vertical blind, and for trimming the length of a vertical blind.

The invention also provides a method of trimming blinds by placing the head rail in a support, and the blind slats in another support, and the bottom rail in another support, and trimming the ends with cutters.

The various features of novelty which characterize the invention are pointed out with more particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

IN THE DRAWINGS

Figure 1 is a perspective illustration of a blind cutting apparatus in accordance with the invention, partially cut away;

Figure 1A is a perspective of a typical venetian blind;

Figure 2 is a side elevation of the apparatus of Figure 1, with movement shown in phantom;

Figure 3 is a section along the line 3-3 of Figure 6;

Figure 4 is an exploded perspective illustration of certain components of the cutting apparatus, with other components removed;

Figure 5 is a perspective illustration corresponding to Figure 4 showing the parts assembled;

Figure 6 is an enlarged side elevation of the portions of the apparatus shown in Figures 4 and 5;

Figure 7 is a side elevation or illustration of a manual mechanism for operating the slat cut-off apparatus;

Figure 8 is a perspective view in schematic form of an end stop mechanism;

Figure 9 is a side view of another slat cutting drive linkage in one position;

Figure 10 is a side view corresponding to Figure 9, in another position;

Figure 11 is a partial side elevation of an alternate embodiment;

Figure 12 shows a further embodiment;

Figure 13 shows a further embodiment for vertical cutting;

Figure 14 is a section along line 14-14 of Figure 13;

Figure 15 is a schematic illustration of a further alternate embodiment of the invention, and,

Figure 16 is a side elevation showing a modification for trimming a vertical blind.

DESCRIPTION OF A SPECIFIC EMBODIMENT

Referring generally to Figure 1, it will be seen that the invention is there illustrated in the form of a blind end trimming apparatus indicated generally as 10 in this case being designed for trimming venetian blinds. Typically the apparatus may be mounted on any suitable form of work table or bench (not shown) which may function both to support the apparatus 10 at a suitable working height, and which may also have suitable supports and guides for holding the venetian blind itself during cutting.

A typical venetian blind V is shown in Figure 1A and has various components including a headrail H a bottom rail B and blind slats S.

As is well known in venetian blinds, the slats are supported on so-called ladder tapes. The tapes are indicated generally as T. Controls in the headrail allow the tapes to be adjusted so as to tilt the slats and either open the blind or close it. There are usually additional controls by which the slats may be raised or lowered.

As explained, it is desirable to provide for cutting of all three blind components namely the headrail, the bottom rail, and also the blind slats themselves, all cuts being made in the same plane, preferably without moving the blind between cuts, so as to

ensure that when trimmed, each side edge of the blind presents a symmetrical even appearance.

It is also desirable that the trim cuts cut off the same length of trim at each end of each component. In this way the tapes T will remain equally spaced from their respective ends of the blind components, after trimming.

The end trimming apparatus 10 will be seen in this embodiment to comprise a base plate 12, and a main support body 14 attached to the plate 12 in a generally upright fashion normal to the plate 12.

The main support body 14 is formed with a headrail opening 16, a bottom rail opening 18, and a plurality of (in this case two) blind slat openings 20-20, spaced apart by a central partition 22.

The headrail opening, the blind slat openings, and the bottom rail opening, are aligned side by side horizontally with one another, and are spaced in such a way that venetian blinds having a relatively wide range of numbers of blind slats, can readily be positioned with their respective headrails, blind slats, and bottom rail in the appropriate openings.

The headrail opening 16 is of rectangular shape in this case, shaped to correspond with the shape of a typical headrail.

The bottom rail opening is likewise shaped to receive a typical bottom rail.

It will be appreciated that blind manufacturers use headrails and bottom rails of varying different designs and shapes, so that any one manufacturer may wish to build an end trimming device suited for its particular blinds only, and not being suited to receive blinds of competitors. Similarly, if such a manufacturer produces blinds having various headrails, bottom rails, and blind slats of various different dimensions and or shapes and profiles, then the manufacturer will supply to its retail outlet a variety of

different end trimming apparatus, so that each retailer can trim a range of different venetian blind designs supplied by that manufacturer.

While the apparatus shown and described so far will suit only one shape of headrail, bottom rail, and blind slat, it is conceivable that such apparatus could be made with interchangeable recesses, and cutters so that it could be adapted to trim the ends of variety of different venetian blind designs, simply by interchanging certain components.

This however is not illustrated herein, and it is believed that it will be obvious to persons skilled in the art as to how this could be achieved.

As explained, the headrail opening, the slat openings, and the bottom rail opening are arranged spaced apart horizontally so that a complete blind consisting of headrail, slats, and bottom rail, may be received with their components in their respective openings. The blind slats can be arranged in groups or bundles and slid through into the two openings provided, in whatever arrangement is most suitable for that particular blind.

As mentioned the entire trimming apparatus 10 is advantageously mounted on a bench, (not shown) with clear space to one side of the main support body member 14, so that the rest of the blind can be supported during trimming. This supporting function may be provided in some cases by one or more rails with guides, but can also simply be provided by a bench or table, at a suitable height.

HEADRAIL AND BOTTOM RAIL TRIMMING

The apparatus for trimming or cutting the headrail and the bottom rail consists , in this embodiment , of a die plate 30, which is slidably mounted on one side of the main support body 14 by means of lower guide 32 and upper guide 34.

The two guides are parallel to one another, and are spaced apart and extend

along parallel diagonal axes at about 45° . The die plate 30 is thus slidable within the guide rails along a diagonal upward and downward movement path. Other movement paths such as arcuate, vertical or otherwise would also serve the purpose. In order to avoid any cutting of the blind slats, by means of the die plate 30, a central rectangular clearance opening 36 is in this case provided in the die plate, registering with the slat openings 20 in the main body 14.

In order to cut the headrail, a headrail cutting recess or die 38 is provided in die plate 30. When the die plate is in one position, the cutting recess 38 is adapted to register with the headrail opening 16 in the support body 14.

When the die plate 30 is moved into the other position, a cutting action takes place, and the opening and the recess are out of registration with one another.

The bottom rail cutting is effected by means of a bottom rail cutting recess or die 40 formed in die plate 30, and adapted to register with the bottom rail opening 18 in support body 14 in one position, and to be out of registration in another position.

Thus movement of the die plate 30 between one position and another position, once the headrail and the bottom rail have been inserted into respective openings and recesses, will produce cutting or trimming of the ends of both the headrail and the bottom rail which may be simultaneous, or almost at the same time, or in sequence depending upon the design (see below), and in the same plane.

At this point it should be noted that the orientation of the headrail openings and the bottom rail openings both in the main body 14 and the die plate 30 are such that the headrail and bottom rail are substantially lying on edge, in planes parallel to one another but spaced apart, with the blind slats between them.

It will however be observed that in this embodiment the direction of the cutting angle is diagonal to the position in which the headrail and the bottom rail are lying. In

this way, the cutting action of the die plate, when it commences movement, takes place initially by applying cutting pressure to one corner of each of the headrail and the bottom rail, and cutting is thus progressive through the two components in a diagonal manner while the two components are held fixed substantially on edge. Other cutting configurations and directions can be used as will be explained below.

This feature may reduce the initial force that must be applied to achieve cutting, and so permits the cutting operation to be performed by manual means. Of course it is possible that the entire operation can be power operated as will become apparent below, although it is believed that this would unnecessarily increase the cost of the apparatus, and add to the cost of installation in a retail store.

For example cutting of the two components could take place in sequence. The bottom rail die recess 40 could be slightly oversize as at 40A in Figure 9, so that cutting of the bottom rail would take place just after cutting of the headrail, to further reduce manual effort. Cutting could also be achieved by moving the cutters on a horizontal linear axis, to simplify construction.

In order to apply manual cutting force to the die plate 30, the die plate 30 is formed with a rectangular recess 42 having a bottom edge 44, normal to the diagonal axis of the die plate, and two side edges 46-46. A top closure bar 48 closes off the rectangular recess 42 for reasons to be described below.

In order to move the die plate 30, a rotary cam member 50 is provided, which is adapted to engage the bottom edge 44 of the recess 42, for movement of plate 30 in one direction, and closure bar 48 closing the recess 42, for movement in the other direction.

The two side edges 46 do not contact the rotary cam, but define clear spaces on either side to permit arcuate movement of cam 50.

The cam 50 is itself mounted eccentrically on a hub 52, which is rotatably mounted in the main body 14. Hub 52 extends outwardly from the main body 14 (Figure 1), and is provided with a manual operating lever 54.

The rotary axis of the cam 50 is offset relative to the rotary axis of the hub 52. Thus when the hub 52 is rotated by manually pulling the lever 54 in the direction indicated by the arrow A, the cam 50 will be forced against the lower edge 44 of the rectangular recess 42 in the die plate 30. This will force the die plate 30 to move on a downward diagonal axis, thereby cutting both the headrail H and the bottom rail B of the blind. Releasing the handle 54 permits a spring (not shown) to return the handle and rotate the hub in the opposite direction, and this will cause the rotary cam to engage the closure bar 48 and cause upward diagonal movement of the die plate 30.

TRIMMING OF BLIND SLATS

The trimming of the blind slats S is carried out in this embodiment as a second cutting function after the trimming of the headrail and the bottom rail. All three components are trimmed in the same apparatus without moving them. In fact they can all be trimmed together if sufficient force is available. Generally however, it is desirable to permit cutting using manual force, since this avoids the requirement for providing some form of electrical or hydraulic power operation. Manual operation is preferred by retail stores to minimise expense and to simplify installation at any location desired in the store.

For this purpose in this embodiment, a slat cutter blade mounting frame 60 is slidably mounted on main body 14, between main body 14 and the die plate 30. Main body 14 is formed with two guide grooves 62, and the blade mounting frame 60 is supplied with two guide bars 64, sliding in the grooves 62. This arrangement is for purposes of illustration only.

The blade mounting frame 60 is of rectangular shape and defines an interior space 66. Space 66 permits the end of the bottom rail to extend through its opening 18, without interfering with frame 60. At one end (right hand end of Figures 4 and 5) a blade or cutter 68 is mounted on the frame 60. The blade 68 is a generally curved shape in end section, so as to provide a generally bevelled trim shape to the ends of the blind slats S. However, the blade 68 can have any shape desired for a particular slat design.

Generally curved blind slat supports 70 and 72 are provided on main body 14, and on partition 22 respectively. In this way, movement of the blade 68 will shear the ends of the slats S, against the support of the arcuate slat supports 70 and 72, thereby providing a clean cut on each slat end. The centre portion of the blade 68 moves in the same plane as the interior surface of the die plate 30. In this way the ends of all the blind components are trimmed in an even and symmetrical manner.

In order to move the blade support frame 60 to and fro, a connecting rod 74 is secured to the free end (left hand in Figures 4 and 5), of frame 60.

Connecting rod 74 may be powered by any suitable means. Preferably, in accordance with this preferred embodiment of the invention, the connecting rod 74 will be powered manually. For this purpose connecting rod 74 is connected through a support block 76 to a rack 78 (Figure 7), and a drive gear 80. Drive gear 80 is connected to a manually operable lever 82 and moves to and fro in slots 81. Swinging of the lever 82 in the direction of the arrow B will cause the connecting rod 74 to drive the blade mounting frame 60 to the right (Figure 4 and 5) and reverse movement will cause reverse movement of the mounting frame 60.

In this way the slat ends may be trimmed in a single manual movement. It will of course be appreciated that the rack and pinion manual operation may be replaced by

any other manual linkage or arrangement or by any suitable power operated means such as a power cylinder or the like. However such substitutions, while not always being acceptable to retail stores, are deemed relatively straightforward for persons skilled in the art.

While in this embodiment the blind slat cutting assembly is incorporated in the trimming apparatus 10, it will also be appreciated that the blind slat openings 20 and supports 70 and 72 could be made separately and could form part of a separate apparatus, with the frame 60 and blade 68 associated with them, so as to be separate from body 14 and from openings 16 and 18, and die plate 30.

The blind slat cutter and the head rail and bottom rail cutters may all be moved by a single manual transmission as disclosed herein or in a variety of ways.

END STOP ASSEMBLY

In order to assist in the use of the apparatus and ensure that the correct amount is trimmed off each end of each blind, an adjustable end stop assembly 90 is provided as shown in Figure 8. This will be seen to comprise a stop arm 92, mounted on a slide bar 94. The slide bar 94 is slidable in a slide block 96, mounted on device 10.

An adjustable fastening screw 98 is provided on arm 92, and suitable indicia may be provided along the bar 94 so that arm may be adjusted to the correct position.

The slide bar 94 is slidable within block 96. It is operated by means of a curved linkage bar assembly 100. One end of the linkage bar assembly is secured to an axle rod 102 extending from hub 52.

A particular length of trim may be selected and the stop arm 92 may be moved to that length and secured by fastening screw 98.

The linkage bar 100 extends through opening 104 in bar 94, so that when bar 100 moves downwardly, bar 94 is driven to the left (Figure 8), and vice versa.

In operation, when a trim cut has been commenced at one end of the blind, the linkage bar 100 moves down through opening 104, thereby moving the stop arm 92 away from the die plate 30. The loose ends or cut off ends of the blind head rail, bottom rail and blind slats may then be removed, after which the arm 54 may be returned once more bringing the stop arm 92 into the stop position.

In certain cases, it may be found that the thickness of the die plate 30 is greater than the length of the trim portion which is desired to cut off from one end of the blind. To overcome this problem, the die plate may be provided with slotted recesses 110 and 112 (Figure 2), extending more or less horizontally and aligned with one another, from the headrail cut off recess 38 and the bottom rail cut off recess 40.

The end stop arm in this case may be made sufficiently thin as at 114 that it will fit within the slots 110 and 112 and thus extend completely across the die plate 30 from the headrail cut off recess 38 to the bottom rail cut off recess 40. This will then permit the operator to set the stop arm 92 at the appropriate position, to provide an end trim of the blind, having a length which is shorter than the thickness of the die plate itself.

As also illustrated in Figures 8, and 9 and 10, it is possible to provide for operation of the blind slat cutting blade, in synchronism with the operation of the die plate for cutting the headrail and bottom rail. This may be achieved, by means of connecting the drive shaft 74 driving the blade assembly, by means of a cross bolt 120, to a lost motion linkage 122. Lost motion linkage 122 has a slotted opening 124 to receive bolt 120, thereby allowing the linkage 122 to move a predetermined distance, before it engages bolt 120.

The other end of linkage 122 is connected (Figures 9 and 10) to a connecting link 126. Connecting link 126 is connected within a slotted recess 128 in hub 52.

In this way when the arm 54 is swung a predetermined distance, toward the

operator to rotate hub 52, so as to cut the headrail and bottom rail, further swinging of the arm 54, through a further distance will cause movement of the bolt 120, and connecting rod 74 thereby causing movement of the blade assembly for shearing the ends of the blind slats.

In this way a single stroke manual movement can provide for cutting of all three components of a blind.

As explained above, it may be desirable to provide that cutting of the headrail takes place first, with the bottom rail being cut in sequence. This can also be achieved as shown in Figure 12. The die plate 30 can have a separate portion 30A, and lost motion links 130 connect it with die plate 30. This would achieve cutting of the two components in sequence.

Cutting of the headrail and bottom rail may take place in various orientations and directions. The Figure 1 embodiment illustrates a diagonal cutting orientation.

However cutting could equally well take place in various other orientations. Figure 13 for example illustrates cutting in a vertical orientation. In this case a main body 140 having headrail and bottom rail openings 142 and 144 as provided, similar to Figure 1 embodiment. A transverse blind slat cutting assembly 146 generally similar to the Figure 1 embodiment is also provided. However in order to shear the headrail and bottom rail, a vertical shear member 148 is provided, mounted in a transverse guide plate 150. A drive cam 152 is mounted to a rotatable hub (not shown) and drives the shear 148 in manner similar to the die cutting plate of Figure 1. In this case, however the movement is vertically, downwardly, and upwardly.

Plate 150 would have an opening 151 to receive the ends of the blind components.

A headrail shear blade 154 is provided is provided on one side of the shear

member 148 and a bottom rail shear blade 156 is provided on the other side registering with the respective headrail and bottom rail openings 142 and 144. Between the two shear blades there is a rectangular clearance space 158, the purposes of which is to fit around either side of the blind slat portion S, extending through the main body 140.

It will also be seen that in this embodiment, by the operation of the cam 152 the entire shear member 148 will be driven downwardly. This will cause the two shear blades 154 and 156 to cut the headrail and the bottom rail. After this, the shear member 148 will be raised upwardly, and cutting of the blind slats S can then proceed in the manner already described above.

It will of course be appreciated that the illustration of two cutting orientations namely diagonal, and vertical, is merely for the sake of illustration and without limitation to the scope of the invention. The invention is deemed to comprehend all such cutting orientations, including horizontally in line with the blind slat cutter movement, as may produce the desired result.

As illustrated in Figure 15, the invention may also be carried out using two separate manual controls, for cutting various of the blind components by manual operations.

In this case, a base plate 170 is shown fitted with a blind component holder member 172. Holder member 172 has a generally rectangular slotted opening 174 to receive the headrail of the blind, and a generally C-shaped opening 176 to receive the bottom rail of the blind. A cutting die plate 178 may be provided, in this case of a similar design to that illustrated in the Figure 1 embodiment. It will also have suitable cutting openings (not shown) registering with the headrail opening 174 and the bottom rail opening 176, for cutting the headrail and the bottom rail. It may be operated by a cam 180 and an arm 182.

In this way, the headrail and the bottom rail of the blind may be cut either simultaneously or in sequence (as described above) by operation of the manual arm 172.

The blind slats in this embodiment would be supported in the blind slat openings 184,186, separated by the supporting partition 190. This enables the blind slats to be arranged in the two openings 184,186, so that they will not all be bunched while they are being cut, but may be grouped in separate bundles, for reasons described above.

A cutting blade 192, for cutting the blind slats, would be operated by means of rods 194 and 196, and wheel 198 and handle 200.

In this way, the cutting of the headrail and the bottom rail is achieved by one manual operation, and the cutting of the blind slats is achieved by another manual operation.

In some circumstances it is also desirable to be able to trim the width of a vertical blind. Typical vertical blinds have a headrail with control rods extending the length of the headrail. Runners within the headrail support a plurality of vertical slats in known manner.

In some cases at a point of sale a customer may require that the vertical blind be trimmed as to width.

This can be achieved by the modification shown in Figure 16.

In this case the support body 202 is formed with a further generally U-shaped recess 204 which is shaped to receive the headrail of a vertical blind. Two control rod holes 206-206 are formed side by side, within the space enclosed by the headrail recess 204. The cutting die plate 208, located on the other side of body 202, is provided with a matching cutting opening (not shown) and cutting holes (not shown) for cutting the vertical blind headrail and control rods.

Depending on the length of the headrail that is cut off, one or more runners and vertical blind slats (not shown) will also be removed by simply sliding them out of the open end of the headrail.

The foregoing is a description of a preferred embodiment of the invention which is given here by way of example only. The invention is not to be taken as limited to any of the specific features as described, but comprehends all such variations thereof as come within the scope of the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An apparatus for trimming the width of blinds of the type having a plurality of components including a head rail, and a plurality of blind slats, said blind slats being adapted to be arranged into at least one blind slat bundle for trimming, and comprising;
 - support body means, said body means defining a head rail opening, and, blind slat bundle opening means, respective said blind components being insertable into respective said openings, with said at least one bundle of blind slats being insertable into a respective said blind slat bundle opening means;
 - a head rail cutter located alongside said support body means for cutting said head rail, and moveable along a head rail cutting path of a first predetermined path length;
 - blind slat bundle cutting means for cutting said at least one bundle of blind slats, spaced from said head rail cutter and being moveable along a blind slat cutting path of a second predetermined path length, said second path length being greater than said first path length;
 - manual means moveable through a single movement stroke of predetermined length, for moving said head rail cutter, and said blind slat bundle cutting means; and,
 - movement transmission connecting said manual means to said head rail cutter and to said blind slat bundle cutting means, whereby a single said movement stroke of said manual means causes said blind slat cutting means, to move along said second movement path, and causes said head rail cutter to move along said first path during a said movement cutting stroke of said manual means, whereby to cut said head rail and

said at least one bundle of blinds slats, in one said movement stroke of said manual means.

2. An apparatus as claimed in Claim 1 wherein said blind includes a bottom rail and including a bottom rail opening in said support body means , and wherein said headrail opening, and said bottom rail opening and said blind slat opening means, are aligned along a common axis.

3. An apparatus as claimed in Claim 2 wherein said head rail and said bottom rail openings and said blind slat opening means are located along a single horizontal axis, whereby to facilitate insertion of respective said blind components in respective said openings.

4. An apparatus as claimed in Claim 3 wherein said headrail cutter plate movement axis is substantially at an angle to said common axis of said bottom rail opening and said blind slat opening means.

5. An apparatus as claimed in Claim 1 wherein the blind is a venetian blind and wherein said blind slat opening means is adapted to receive said blind slats of said venetian blind, and including blind slat passage means in said headrail cutter which is oversized relative to said blind slat opening means, whereby movement of said headrail cutter does not effect cutting of said blind slats.

6. An apparatus as claimed in Claim 5 and including blind slat cutter blade means slidably mounted on said support body means, and being movable relative to said blind

slat opening means, whereby to cut said blind slats, upon movement of said blind slat cutter blade means.

7. An apparatus as claimed in Claim 6 including blind slat support means defining a predetermined profile, and mounted on said support body means and wherein said blind slat cutter blade means defines a corresponding predetermined profile, whereby said blind slats are trimmed in accordance with said predetermined profile.

8. An apparatus as claimed in Claim 1 and including partition means mounted on said support body means in said blind slat opening means for separating said blind slats into groups whereby said groups of blind slats are cut in sequence, upon movement of said blind slat cutter means.

9. An apparatus as claimed in Claim 1 wherein said means for moving said headrail cutter comprises a manually operable lever means, mounted on said support body means, and linkage means connecting said lever means with said head rail cutter for transmitting movement of said manual lever means thereto.

10. An apparatus as claimed in Claim 1 and including a blind slat cutter manual lever means mounted on said support body means, and operable to cause movement of said blind slat cutting means.

11. An apparatus as claimed in Claim 1 including end stop means adjacent said cutter means, for engaging the free ends of said blind components, whereby to define a predetermined length of cut in respect thereof.

12. An apparatus as claimed in Claim 11 including linkage means connected to said end stop means and responsive to movement of said plate, whereby to move said end stop means free of said blind components, for clearing of portions of said blind components.

13. An apparatus as claimed in Claim 8, and including linkage means connecting said blind slat cutting means to said manually operable lever means whereby said head rail cutter, and said slat cutting means may be moved in sequence one after the other, by a single movement of said manually operable lever means.

14. An apparatus as claimed in Claim 2, and wherein said blind slat opening means is located between said headrail opening and said bottom rail opening in said support body means.

15. An apparatus as claimed in Claim 1 wherein said blind components are insertable through said support body from one side, and wherein said head rail cutter and said blind slat cutting means are located on the other side of said support body means.

16. An apparatus as claimed in Claim 1 including a bottom rail cutter blade, and wherein said bottom rail cutter blade is moveable along a predetermined path, said path defining a greater movement distance than said headrail cutter whereby said headrail and said bottom rail are cut in sequence one after the other.

17. An apparatus as claimed in Claim 1 including lost motion connection means

connecting said manual movement means with said blind slat cutter, for movement of said headrail cutter, and of said blind slat cutting means , in sequence.

18. An apparatus for trimming the width of blinds of the type having a plurality of components including a headrail, a bottom rail, and a plurality of blind slats, each having a predetermined profile, and comprising;

support body means defining a headrail opening, and a bottom rail opening, and blind slat opening means, respective said blind components being insertable into respective said openings;

a headrail and bottom rail cutting means located alongside said support body means, and having, a headrail cutting blade, and, a bottom rail cutting blade, and,

means for moving said headrail cutting means a predetermined first distance relative to said support body means for cutting said headrail; and,

means for moving said bottom rail cutting means a predetermined second distance relative to said support body means for cutting said bottom rail; said second distance being greater than said first distance.

19. An apparatus as claimed in Claim 18 and including blind slat cutter means mounted on said support body means, and being movable relative to said blind slat opening means, and partition means in said blind slat opening means for separating said blind slats into groups whereby said groups of blind slats are cut in sequence, upon movement of said blind slat cutter means.

20. An apparatus as claimed in claim 18 and including second headrail opening means in said body means for receiving the headrail of a vertical blind and a second

headrail cutter means for cutting said second headrail.

21. An apparatus as claimed in claim 20 wherein said blind includes a control rod and including control rod opening means for receiving said control rod , and a control rod cutting means for cutting the same.

22. An apparatus for trimming the width of blinds of the type having a headrail, a plurality of blind slats, and a bottom rail, each having a predetermined profile, and comprising;

a first body means defining a headrail opening,

a second body means defining blind slat passage means for reception of said blind slats, and, a bottom rail opening, respective said blind components being insertable into respective said openings;

a headrail cutter means, a blind slat cutter means and a bottom rail cutter means;

means for moving said head rail cutter means along a cutting path of different length relative to the others for cutting of said headrail and

means for moving said blind slat and bottom rail cutter means, along a cutting path of different length relative to said length of said head rail cutting means, for cutting of said blind slats and said bottom rail.

23. An apparatus as claimed in Claim 22 including guide means for guiding movement of said head rail cutting means relative to said first body means.

24. An apparatus as claimed in Claim 22 and including cutter plate means for

carrying said head rail cutter means, and opening means in said cutter plate means for reception of said blind components therethrough.

25. An apparatus as claimed in Claim 22 and including blind slat opening means in said second body and blind slat cutter blade means mounted thereon, and blind slat cutter blade means being movable relative to said blind slat opening means, and partition means in said blind slat opening means for separating said blind slats into groups whereby said groups of blind slats are cut in sequence, upon movement of said blind slat cutter blade means.

26. An apparatus for trimming the width of blinds of the type having a headrail, a plurality of blind slats, and a control rod, and comprising;

a first body means, defining a headrail opening, in which a headrail component is insertable and a control rod opening into which a control rod may be inserted;

a second body means defining a headrail cutter means and control rod cutter means, and,

means for moving said second body means, relative to said first body means for cutting of said headrail and said control rod.

27. An apparatus for trimming of blinds of the type having a plurality of blind components including a blind headrail having a generally rectangular three sided channel shaped profile, a blind bottom rail having a first generally arcuate profile, and a plurality of blind slats, each having a second generally arcuate profile, and comprising;

a support body, said support body defining a blind headrail opening, a blind bottom rail opening, and at least one blind slat opening, said blind headrail opening, said blind bottom rail opening, and said at least one blind slat opening said openings being aligned along a transverse axis ;

at least one partition in said blind slat opening for separating said blind slats into groups of blind slats whereby said groups of blind slats are cut in sequence;

a blind headrail cutter located alongside said support body;

a blind bottom rail and slat cutter for cutting said blind bottom rail and said blind slats, said bottom rail and slat cutter being movable along a cutting axis , wherein said blind slat opening is located between said blind headrail cutting opening and said blind bottom rail cutting opening, spaced apart from one another along said transverse axis;

a guide on said support body for movably supporting said blind headrail cutter, said guide defining a predetermined blind headrail cutter movement axis, whereby said blind headrail cutter is movable relative to said blind headrail opening in said support body;

a first driver connected to said blind bottom rail and slat cutter for moving said blind bottom rail and blind slat cutter to cut said blind bottom rail and said blind slat groups; and,

a second driver connected to said blind headrail cutter for moving said blind headrail cutter.

28. A method of trimming the width of venetian blinds of the type having a head rail, a plurality of blind slats and a bottom rail, said method comprising steps of:
- placing an end of said head rail of said venetian blind through a head rail

opening in a support body;

placing an end of said bottom rail through a bottom rail opening;

placing ends of a first bundle of said blind slats through a first blind slat opening in said support body;

placing ends of a second bundle of said blind slats through a second blind slat opening in said support body, said first and second blind slat openings being separated by spacer means, whereby said ends of said head rail and said bottom rail and said blind slats extend through respective openings;

placing said ends of said head rail and said bottom rail through respective head rail and bottom rail openings in a head rail cutting means and in a bottom rail cutting means;

placing said ends of said two bundles of said blind slats in registration with blind slat cutting means;

moving said bottom rail and said blind slat cutting means along a cutting path of a first predetermined length whereby bottom rail and blind slats are cut by respective said cutting means; and,

moving said head rail cutting means along a cutting path of a second predetermined length whereby said head rail is cut, said first length being greater than said second length.

- 29 A method as claimed in claim 28 wherein said bottom rail opening, said blind slat openings and said head rail opening are all aligned along a common horizontal axis.

30. A method as claimed in claim 28 wherein said step of moving said head rail and bottom rail cutting means includes actuating a rotary cam mechanism to obtain cutting of said end of said head rail .
31. A method as claimed in claim 30 wherein said step of actuating said rotary cam mechanism also causes cutting of said ends of said blind slats.
32. A method as claimed in claim 28 including the steps of after said ends of said head rail and said bottom rail and said blind slats are cut; placing the other ends of said head rail and said bottom rail and said blind slats of said venetian blind through said head rail and bottom rail and blind slat openings in said support body whereby said ends of head rail and said bottom rail and said blind slats extend through respective ones of said head rail and bottom rail and blind slat openings;
- placing said other ends of said head rail and said bottom rail through said corresponding head rail and bottom rail openings in said head rail and bottom rail cutting means;
- placing said other ends of said blind slats in registration with blind slat cutting means and,
- moving said cutting means through said predetermined first and second cutting paths, thereby cutting said other ends of said head rail and bottom rail and said blind slats.
33. A method as claimed in claim 31 further comprising the step of cutting substantially equal amounts from both ends of said head rail, said bottom rail

and said blind slats of said venetian blind so that said venetian blind has a symmetrical appearance.

34. A method as claimed in claim 28 including a cutter block defining a bottom rail opening, and blade means on said block adjacent said opening for cutting said bottom rail and a blind slat cutter blade supported on said block for cutting said blind slats, and a head rail die block and head rail cutting die, separate from said cutter block for cutting said headrail, and moving said cutter block by linkage means a first predetermined distance to progressively cut said bottom rail and said blind slats, and moving said die block to cut said head rail, said die block moving a predetermined second distance different from said first distance.

35. A method as claimed in claim 34 wherein said step of moving said cutter block comprises moving a first manual movement lever, without moving said die block, and wherein said step of moving said die block comprises the step of moving a second manual movement lever without moving said cutter block, thereby separating said cutting steps between said first and second manual movement levers.

36. An apparatus for trimming the width of venetian blinds of the type having a head rail, a plurality of blind slats, and a bottom rail, suspended from said head rail, each having a predetermined profile, and comprising;

a first body means, defining a head rail support opening, and a blind slat support opening means, and a bottom rail support opening, said head rail, said bottom rails, and said blinds slats being insertable into respective said support openings;

a second body means moveable along a predetermined cutting axis relative to

said first body means;

a bottom rail opening in said second body means;

blind slat cutter means mounted on said second body means for movement therewith along said predetermined cutting axis relative to said said first body for cutting said blind slats;

bottom rail cutter means mounted on said second body adjacent said bottom rail opening therein, for movement therewith along said predetermined cutting axis;

a head rail cutter moveable relative to said first body means for cutting said head rail;

manual lever means for moving said second body means, and said head rail cutter for cutting of said bottom rail and said blind slats, and said head rail.

37. An apparatus for trimming the width of venetian blinds of the type having a head rail, a plurality of blind slats, and a bottom rail each having a predetermined profile, and have first and second blind control elements in said head rail, said control elements being located at predetermined positions spaced apart from one another along said head rail, and spaced inwardly from each end of said head rail, whereby when equal length trim portions are removed from each end of each of said components, said control elements remain spaced equally apart from one another and spaced inwardly from each end of said head rail by predetermined inward spacing distances, and comprising;

a first body means, defining a head rail opening, a bottom rail opening, and blind slat opening means respective said blind components being insertable into respective said openings for support during trimming;

a second body means moveable relative to said first body means;

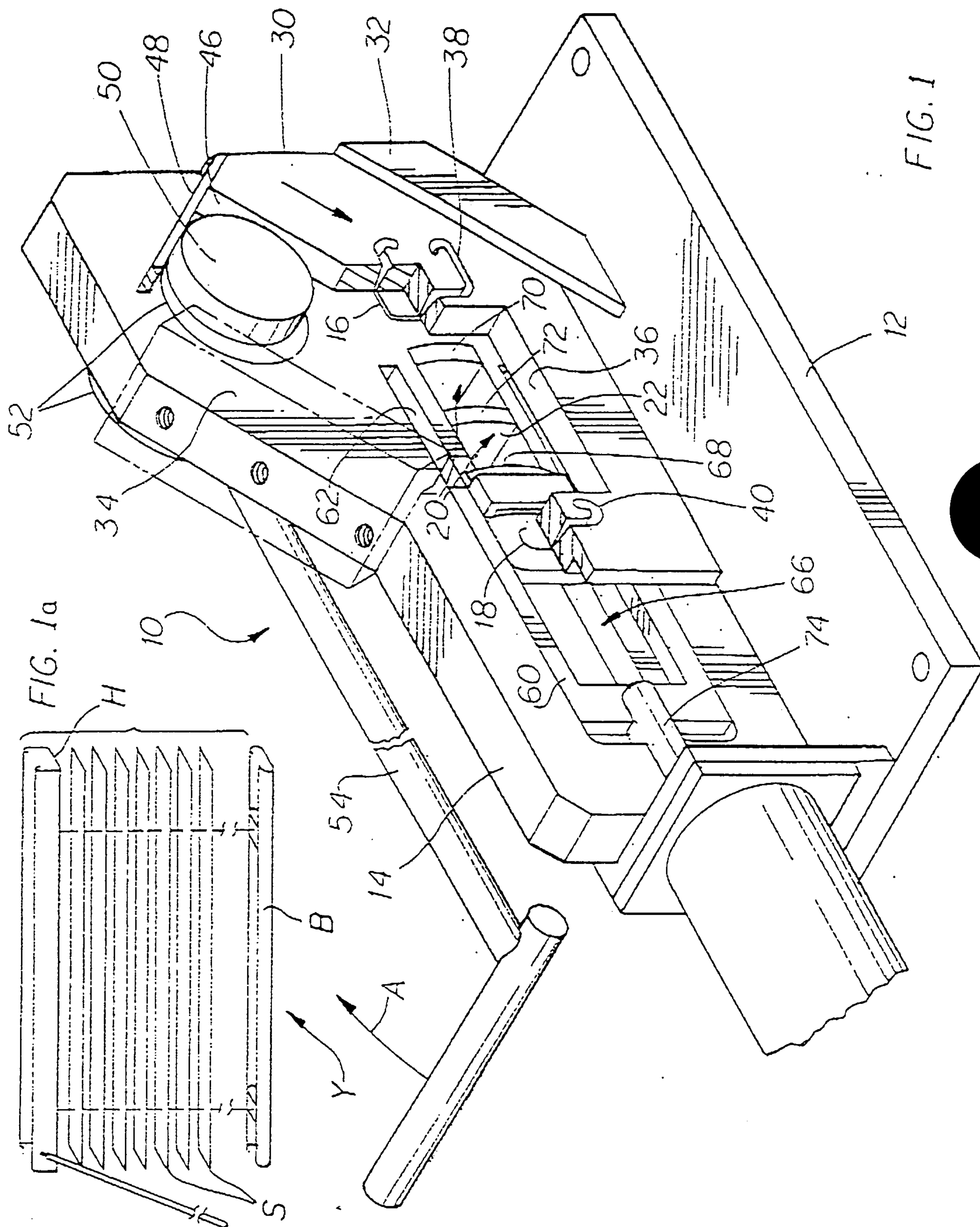
a head rail cutter moveably mounted on said first body for cutting a predetermined trim length from one end of said head rail;

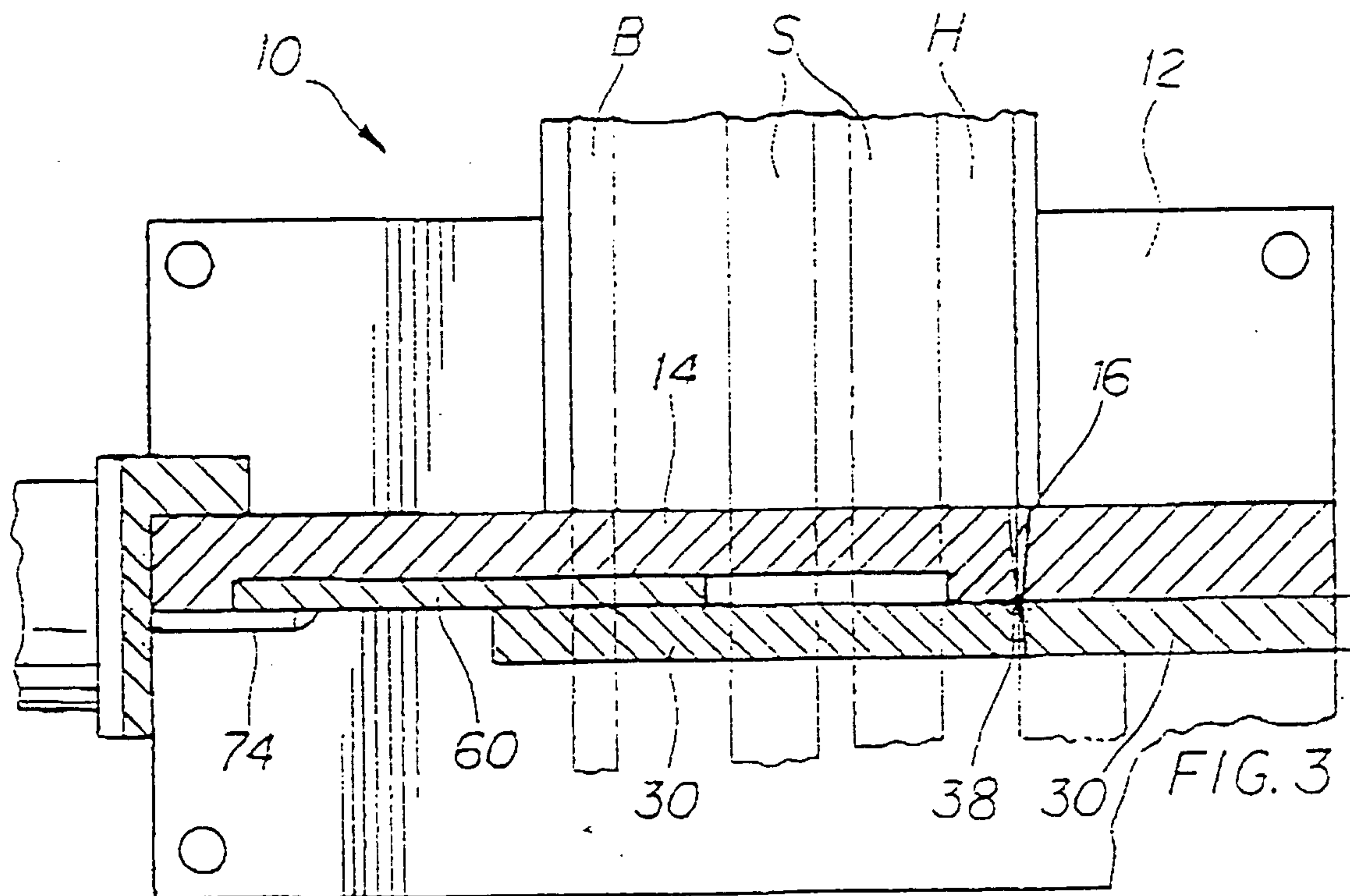
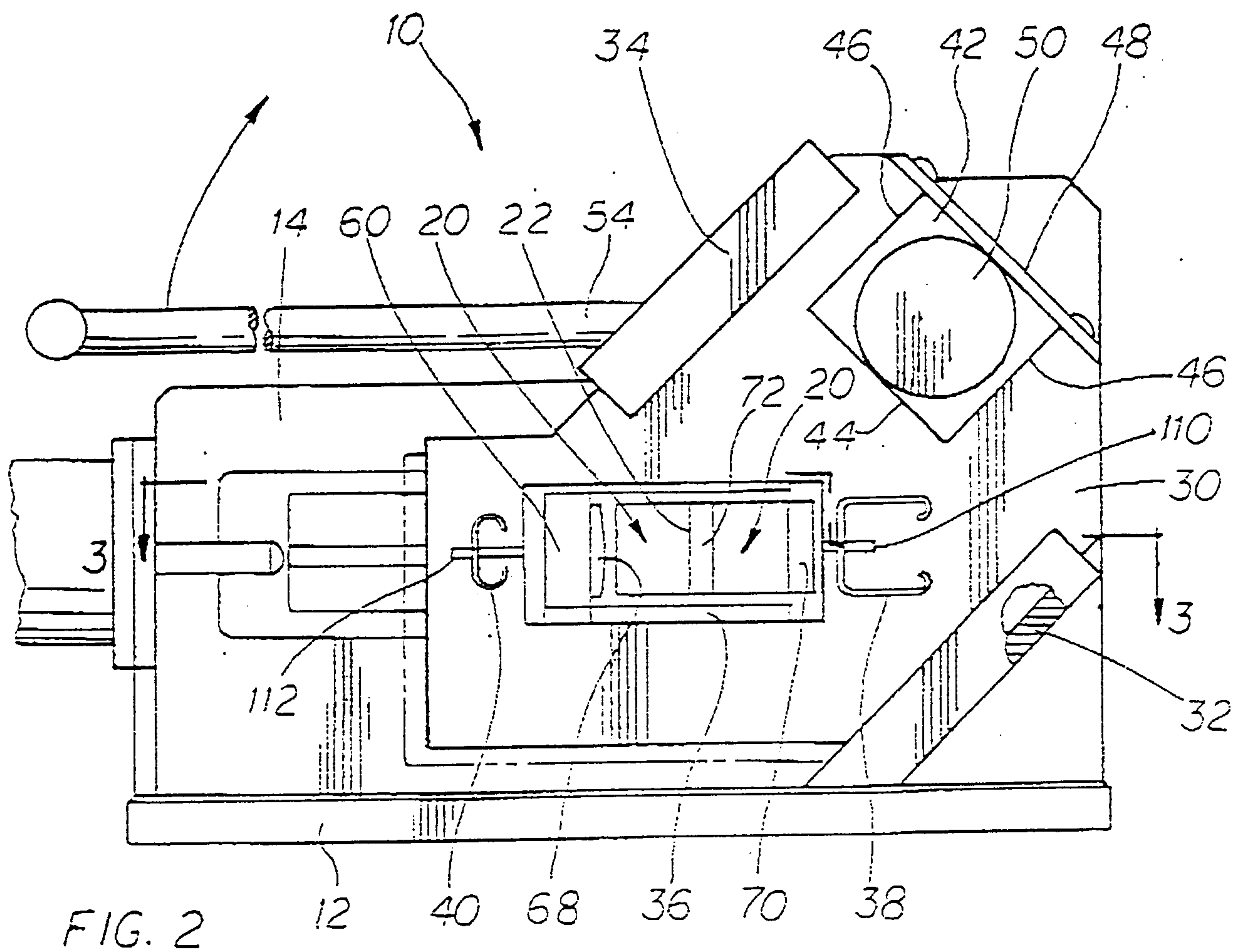
blind slat cutter means on said second body for trimming a trim cut of a predetermined length equal to said length of said trim cut off said head rail, from said blind slats, whereby to trim one end of said venetian blind components by trim cut lengths which are equal to one another;

bottom rail cutter means on said second body for trimmming a trim cut of predetermined length from said bottom rail;

manual means for moving said head rail cutter and said second body means, relative to said first body means whereby to cut said trim cut of predetermined length from said head rail, said bottom rail and said blind slats ; and,

manual means for operating said head rail cutter and said second body whereby to cut said trim cuts from said head rail, said bottom rail and said blind slats, all said trim cuts having a length equal to one another, and trim cuts of said head rail and said blind slats being repeatable at the other ends thereof in the same said apparatus whereby after said trim cuts are removed from both said ends of said blind components said control elements remain spaced inwardly from each said end of said head rail, by inward spacing distances which are reduced relative to the untrimmed length of said components by amounts equal to the length of respective said trim cuts from said blind components.





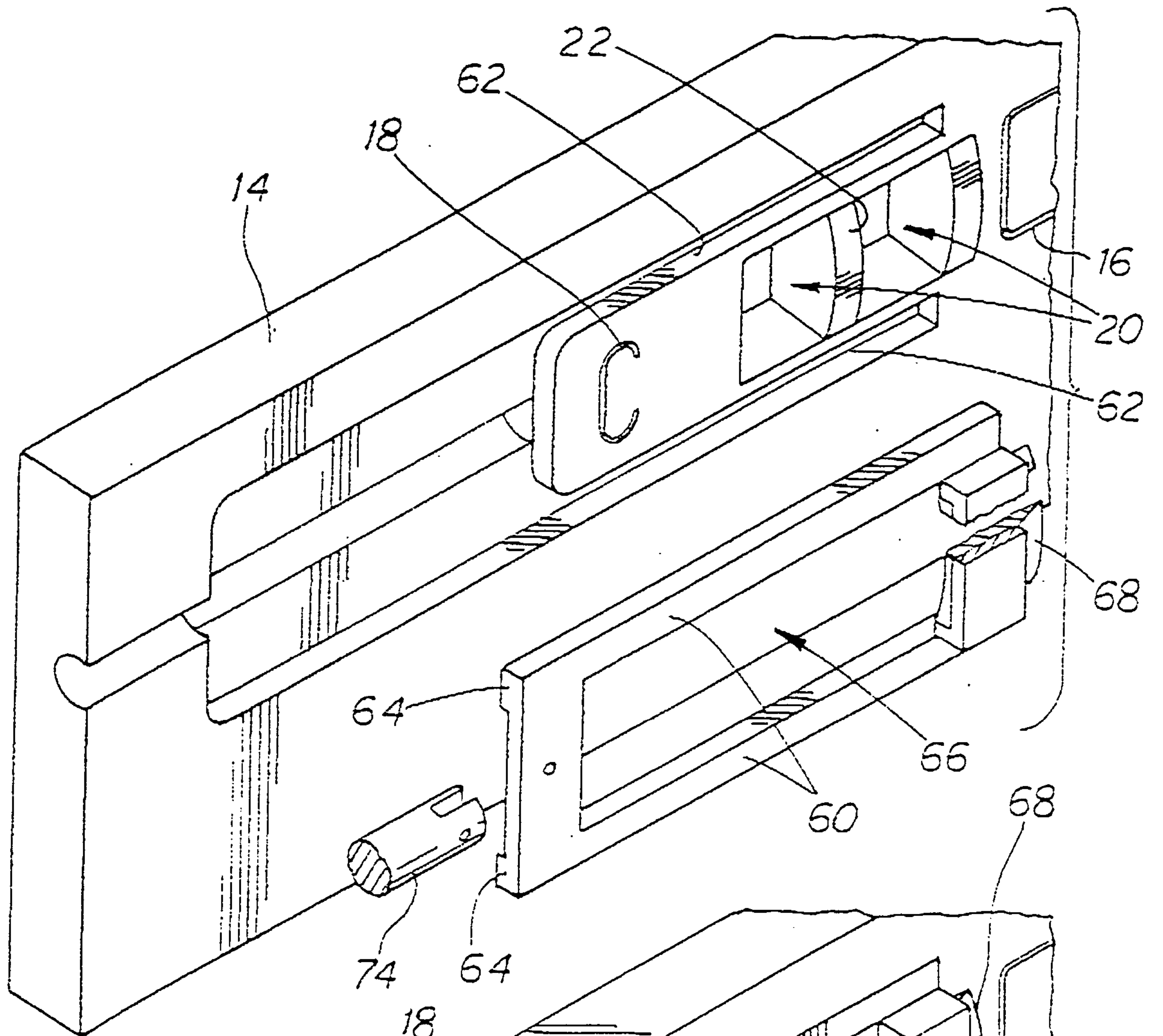


FIG. 4

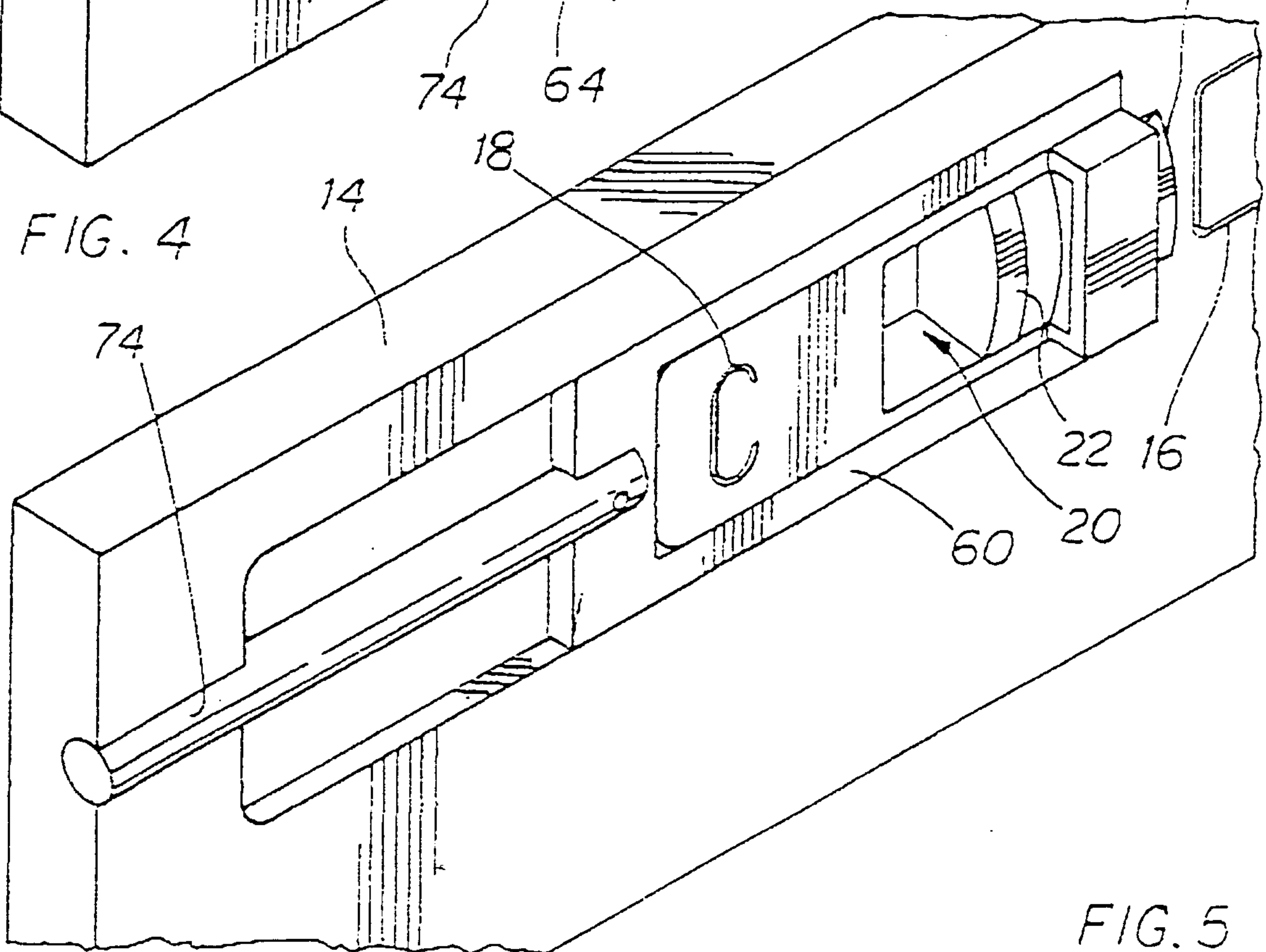
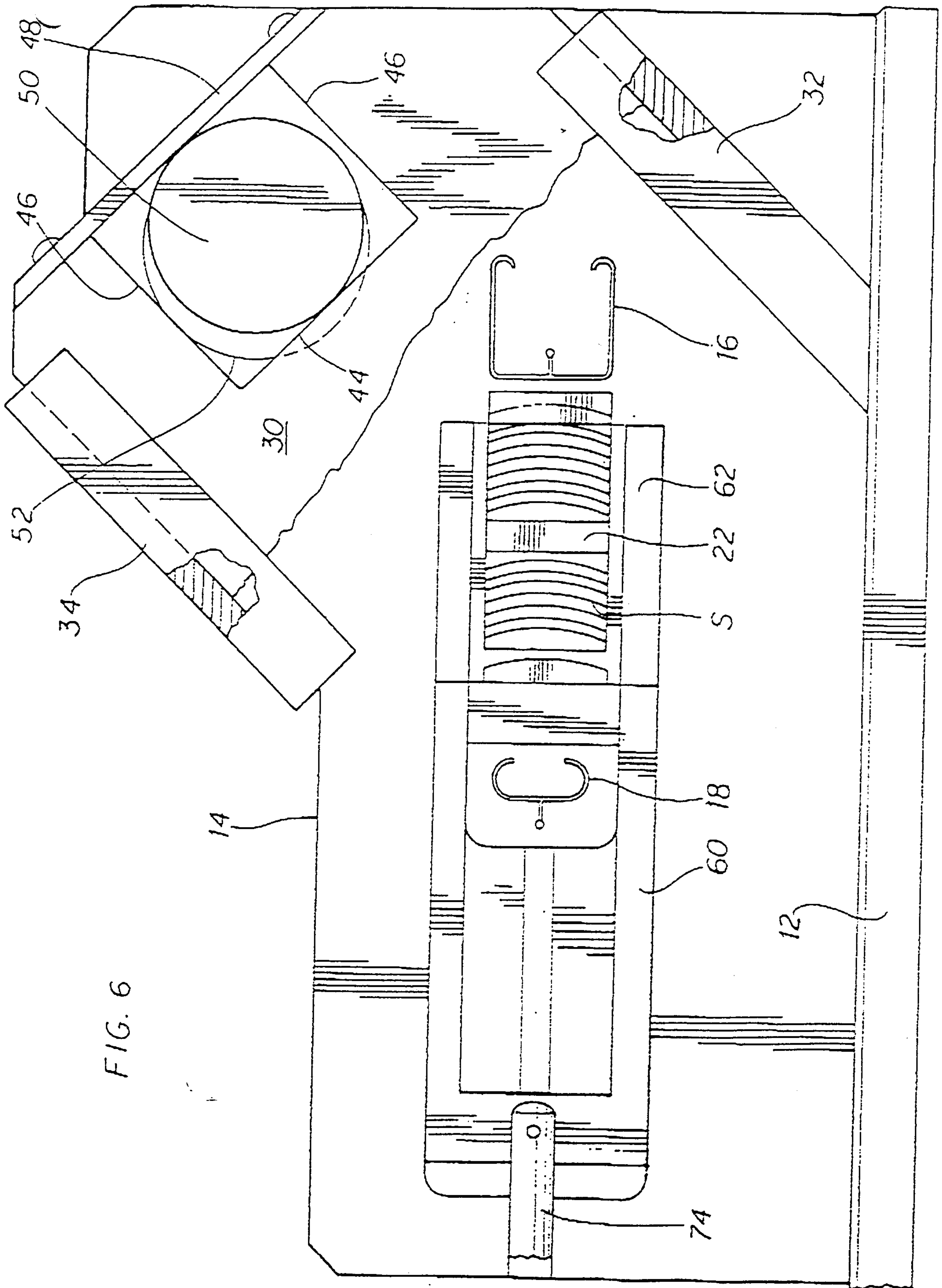


FIG. 5



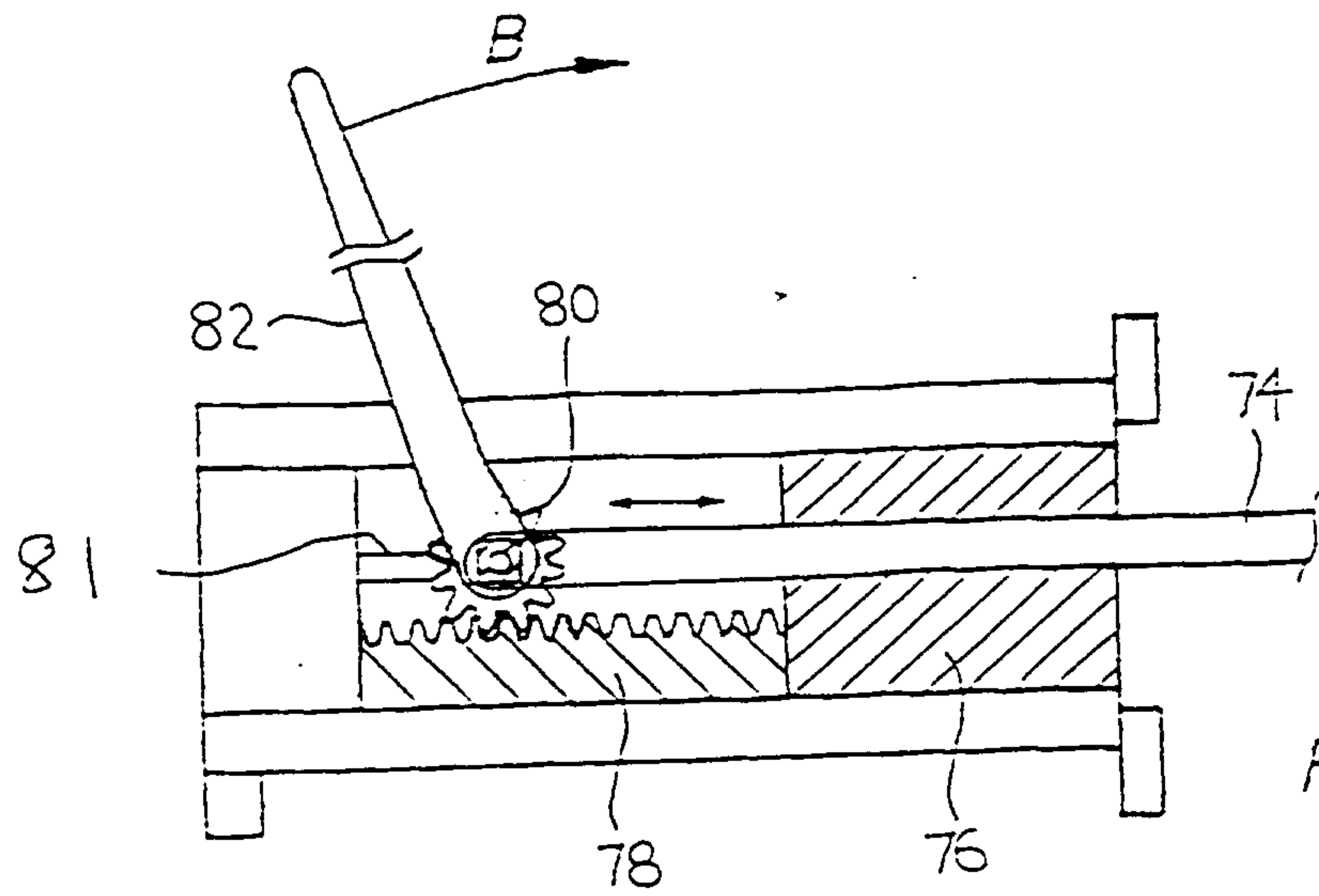


FIG. 7

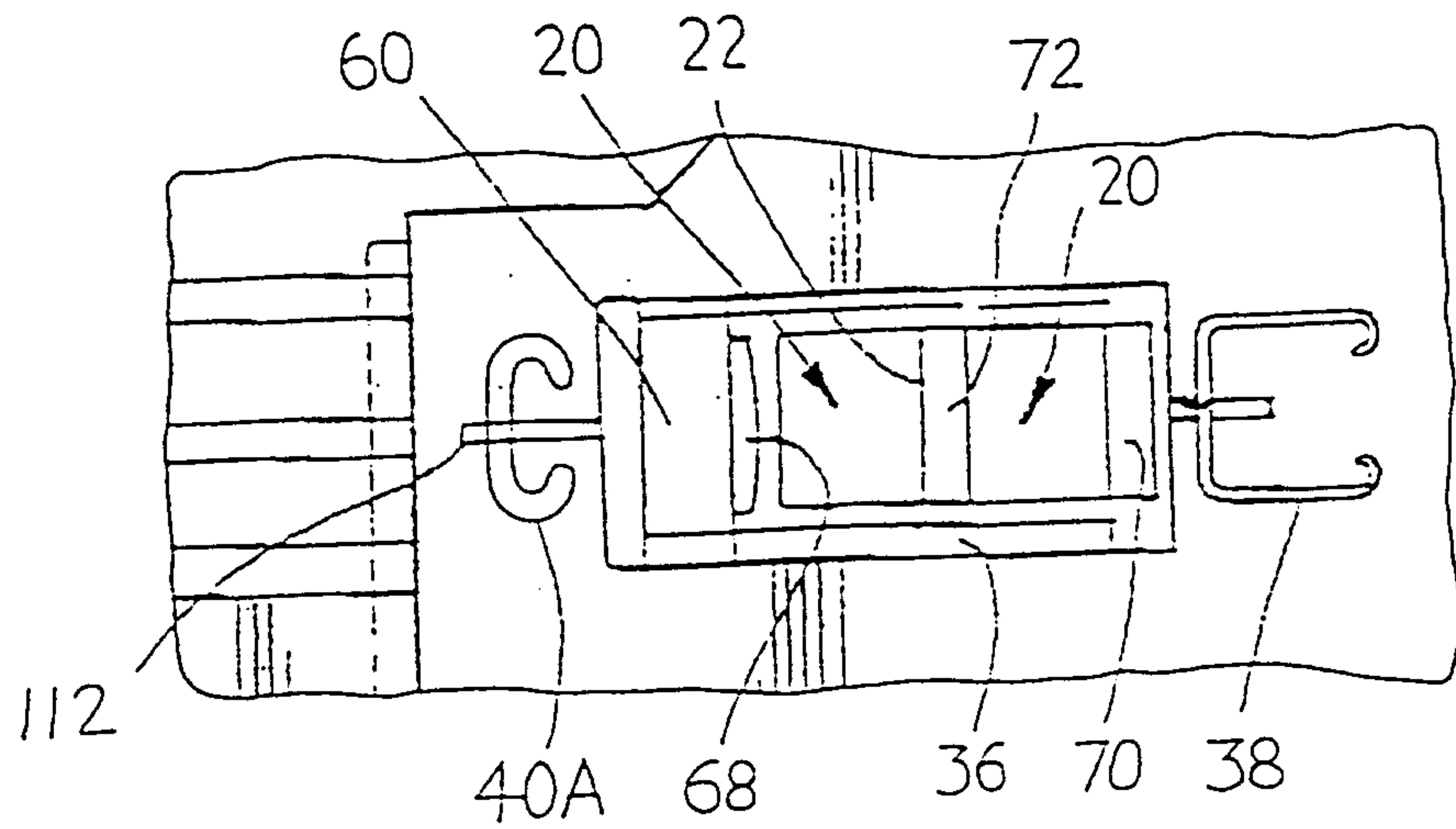


FIG. 11

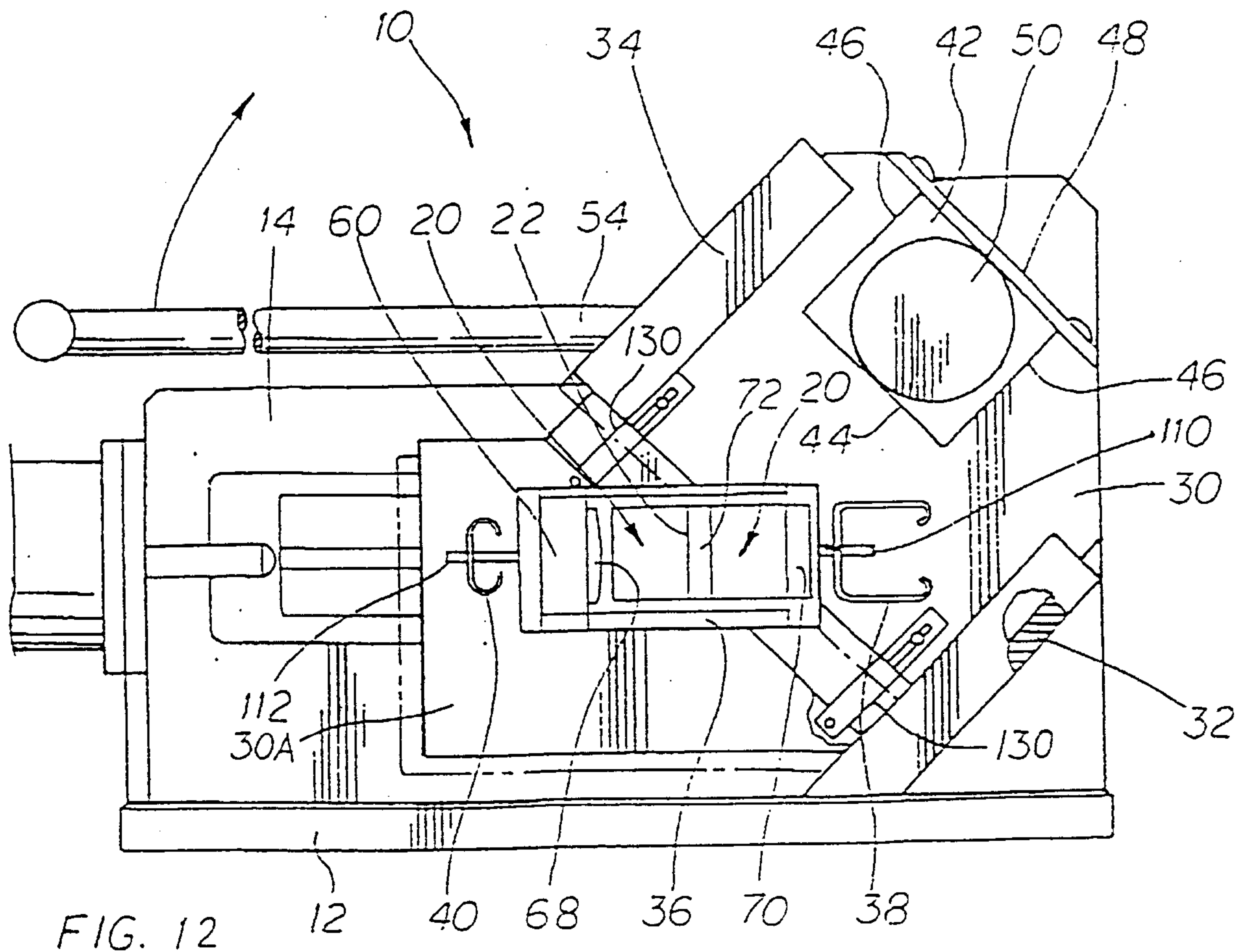


FIG. 12

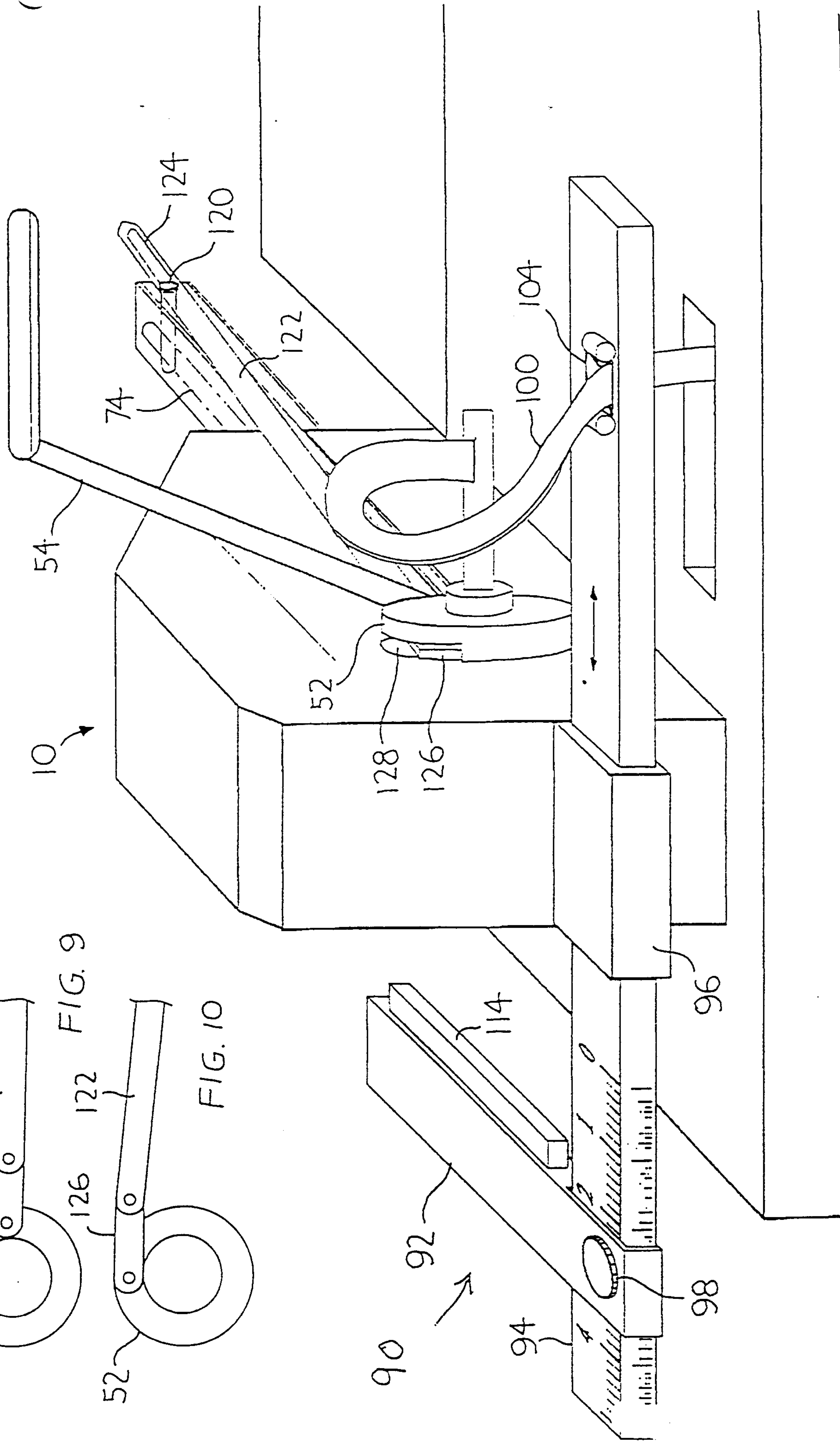
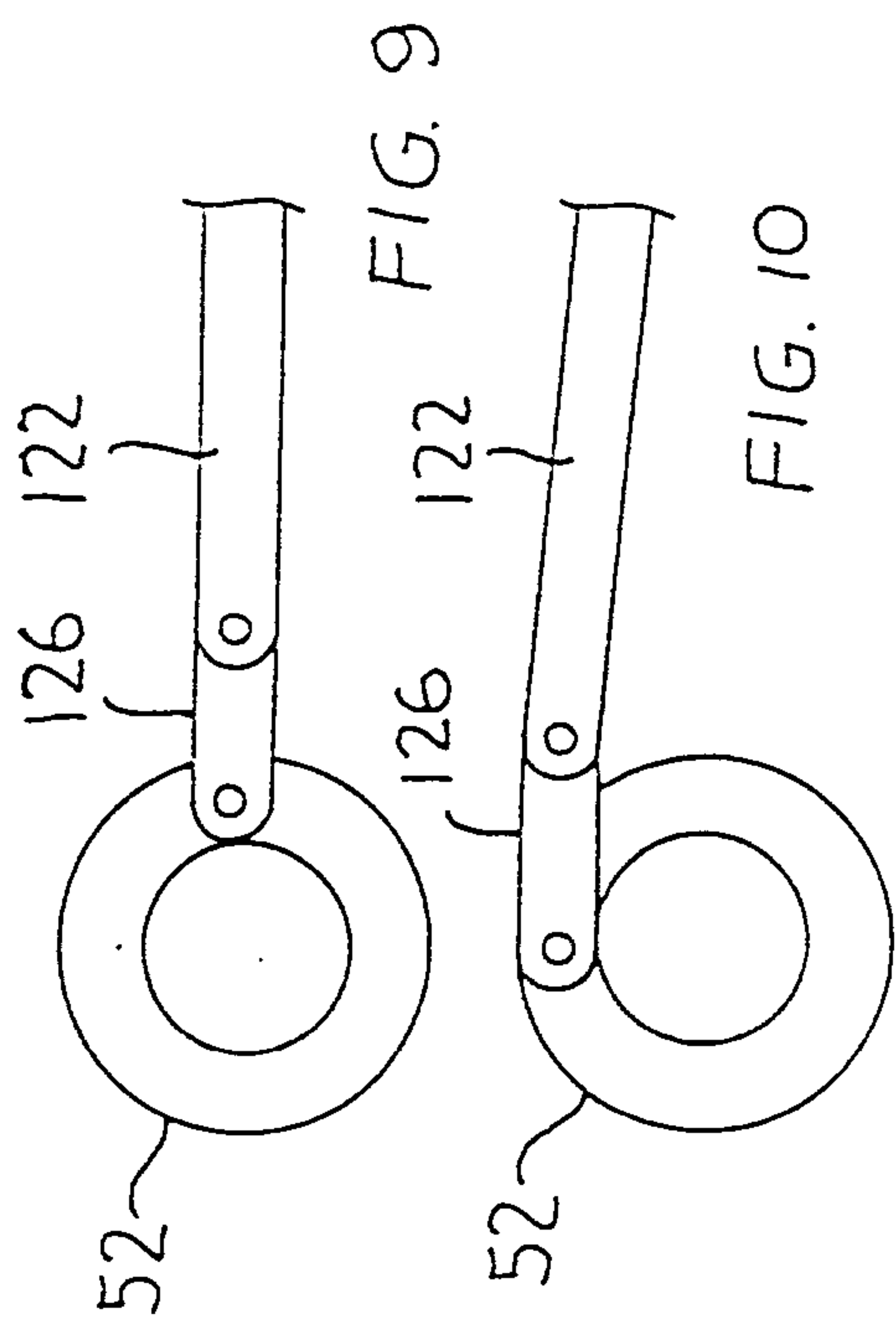


FIG. 8

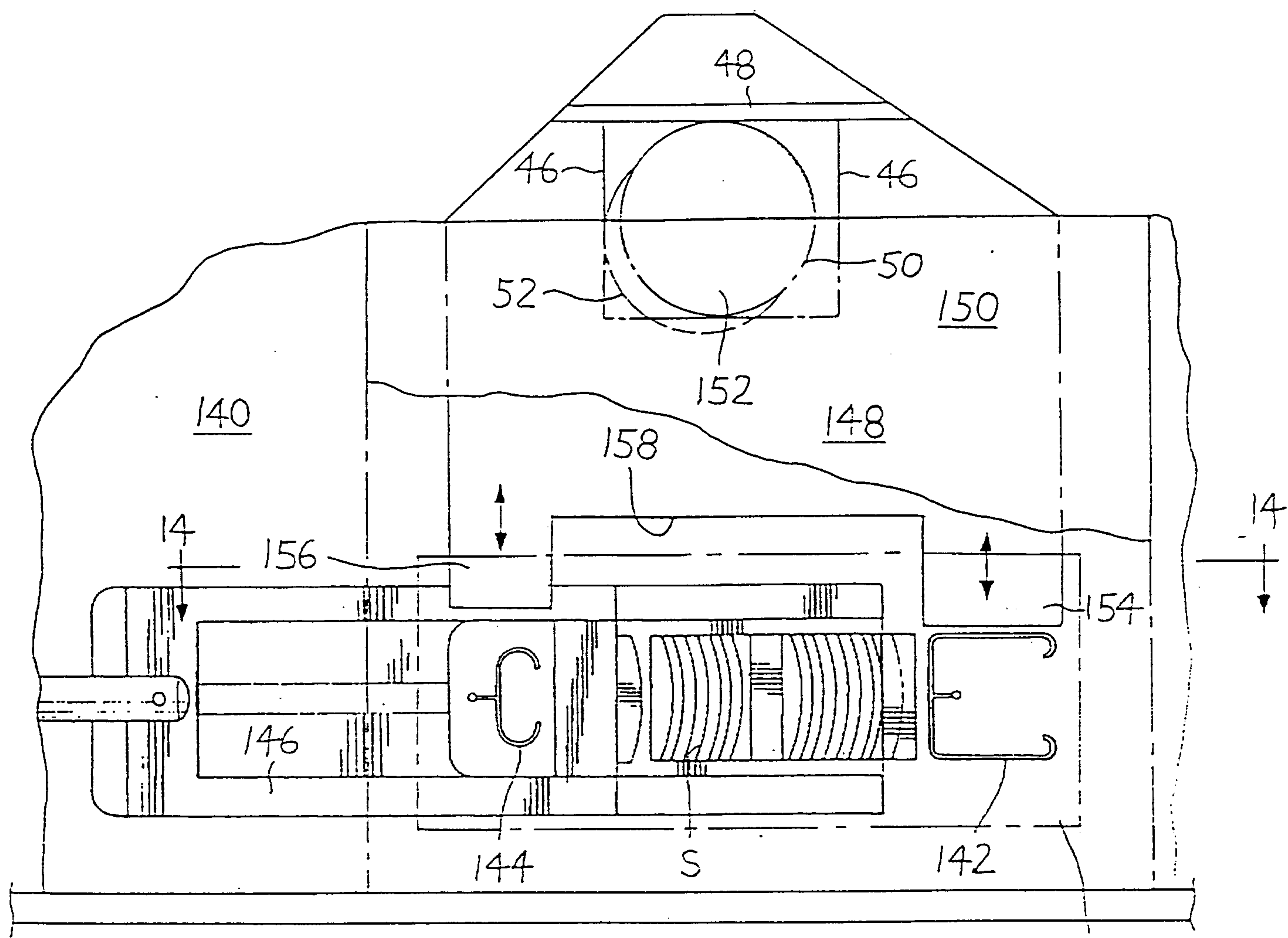


FIG. 13

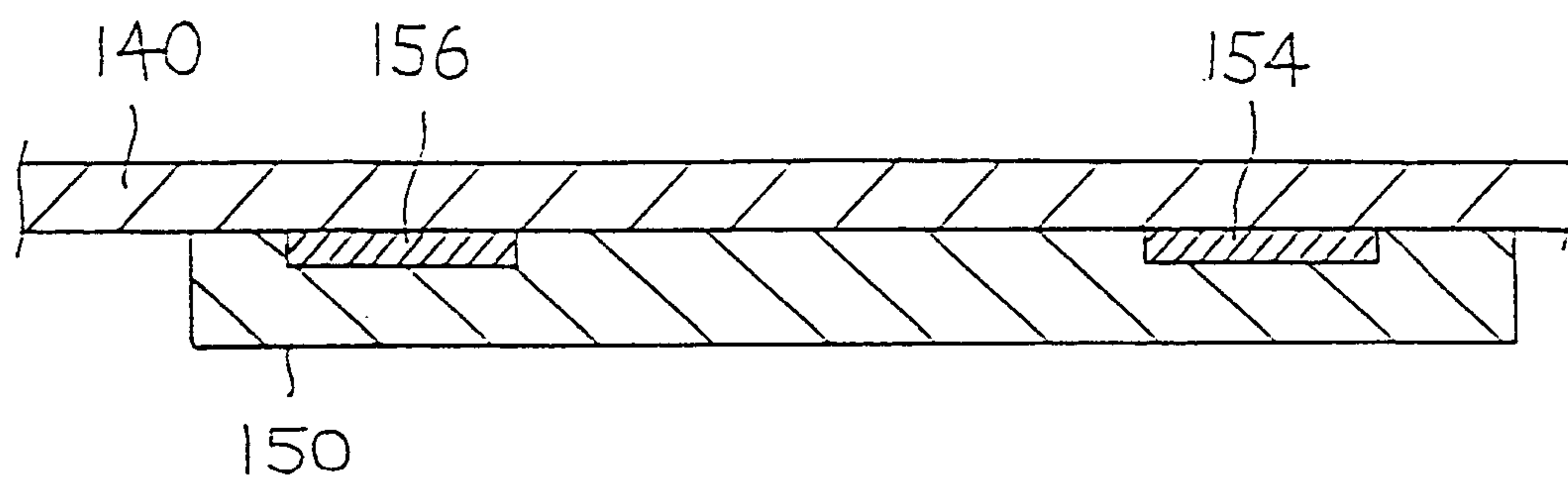


FIG. 14

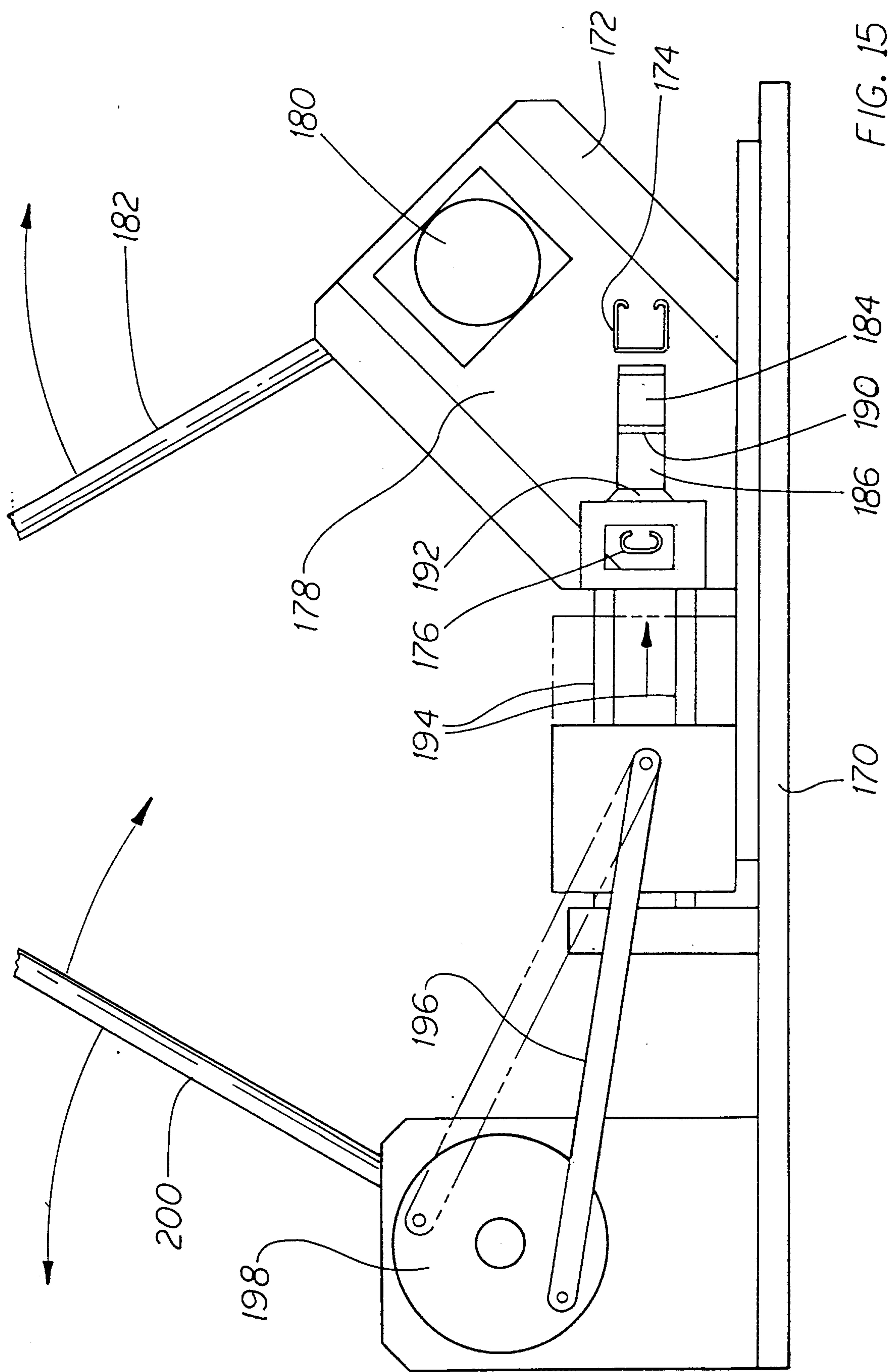


FIG. 16

