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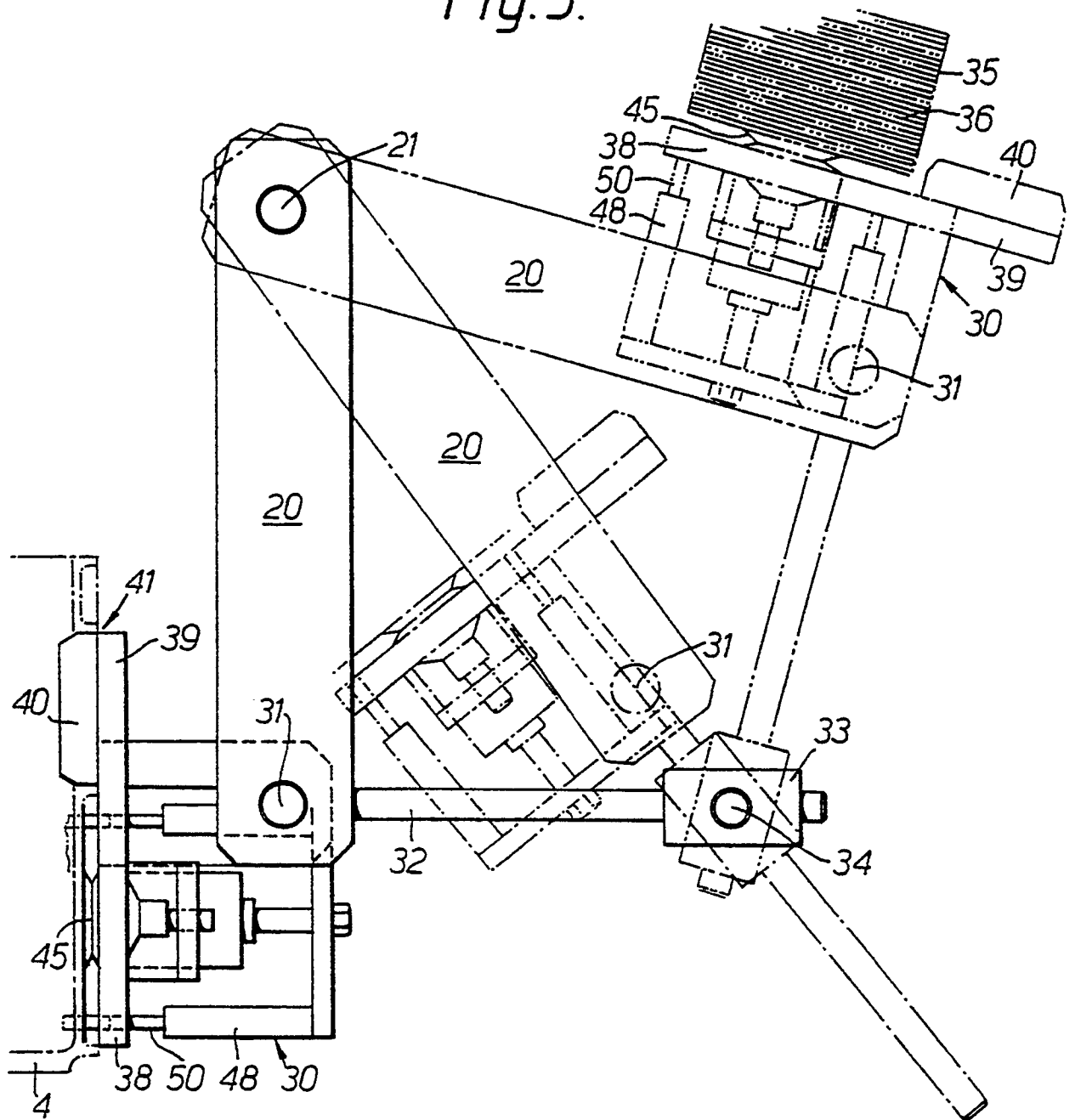
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Applicator for attaching identification panels to bottle crates.

A machine for applying a panel to the side wall of a bottle crate (4) comprises a workstation (2) at which application of the panel is effected, a panel feed and attachment head (30) pivotal towards and away from the workstation, actuating means (20, 25) to move the head from a first position in which it can receive a panel from a supply (35) to a second position in which it can apply the panel to an adjacent side wall of a bottle crate present at the workstation. Holding means (44, 45) hold the panel on the head between the first and second positions and release means (50) is carried by the head for securing the panel onto the crate side wall when the panel has been released by said holding means.

Fig. 3.



This invention relates to a machine incorporating applicator means for applying a panel to the side wall of a bottle crate. The machine is particularly useful for detachably connecting display panels of the type disclosed in GB 8914727.6 to opposed side walls of bottle crates.

The invention provides a machine for applying a panel to the side wall of a bottle crate which machine comprises a workstation at which application of the panel is effected, means including a panel feed and attachment head pivotal towards and away from the workstation, actuating means to move said pivotal means from a first position in which it can receive a panel from a supply to a second position in which it can apply the panel to an adjacent side wall of a bottle crate present at the workstation, means to hold said panel on said feed and attachment head between said first and second positions and means carried by said feed and attachment head for securing said panel onto the crate side wall when the panel has been released by said holding means.

An embodiment of the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:-

FIGURE 1 is a schematic side elevation of part of a machine in accordance with the present invention for applying display panels to the sides of bottle crates;

FIGURE 2 is a schematic end elevation of part of the machine shown in Figure 1;

FIGURE 3 shows on an enlarged scale, and in more detail, the mechanical construction and operation of a part of the machine which handles the display panels; and

FIGURE 4 is a front elevation of a display panel positioning head of the machine.

Referring first to Figure 1, the machine includes three continuously moving conveyor sections connected in tandem, comprising a first infeed conveyor 1, an intermediate workstation conveyor 2, and a third out-feed conveyor 3. Infeed conveyor 1 delivers crates 4, each carrying twenty four bottles 5, to workstation conveyor 2 two at a time in single file by means of a pneumatically operated stop 6 which is moved up and down into the path of movement of the crates 4 at the appropriate intervals. The stop 6 is shown in Figure 1 in its lowered position.

Passage of the two crates along the workstation conveyor 2 is interrupted at a predetermined central position thereon by a second pneumatically operated stop 8 which is likewise moved up and down into and out of the path of movement of the crates at appropriate intervals in synchronism with the first pneumatically operated stop 6. Beneath each of the stationary crate positions on the workstation conveyor 2 is a respective bottle-lifting mechanism 9, 9' each comprising a rectangular plate 11, 11', corresponding in dimension to the base of the crate 4 and formed on its upper

surface with an array of vertically projecting rods 12, 12' corresponding in number and spacing to the bottles in the crate 4. Upon operation of the pneumatic cylinders 9, 9' to lift plates 11, 11', rods 12, 12' operate through appropriately spaced apertures in base of the stationary crates 4 on the workstation conveyor 2 to lift each of the bottles 5 simultaneously. This relieves the crates 4 of the weight of the bottles 5 to facilitate accurate positioning of the crates on the workstation conveyor 2.

Associated with each stationary crate position on the workstation conveyor 2 is a respective display panel attachment station 15, 15' some details of which have been omitted from Figure 1 for clarity. As seen in more detail in Figure 2, which shows a schematic end elevation of the attachment station 15, 15' the attachment station comprises an identical pair of opposed display panel mechanisms, one on each side of the stationary crate position. In order to simplify the description, only the display panel mechanism on the right hand side (as shown in Figure 2) of the crate 4 will be described, although corresponding parts of the left hand side mechanism bear the same reference numbers.

Each mechanism comprises an arm 20 pivoted about a fixed axis 21 parallel to the direction of travel of the conveyor 2. The arm 20 is flexibly coupled at one end, via a rigid link 22, to one end of a bar 23 to the other end of which the arm 20 of the left hand side display panel mechanism is similarly coupled. The bar 23 is rigidly connected via rod 24 to a pneumatic cylinder 25 which moves it up and down upon actuation to swing the arm 20 between respective lower and upper positions as illustrated. The other end of the arm 20 carries a display panel feed and attachment head 30 which is pivotally coupled to it to rotate about an axis 31 which is parallel to fixed axis 21. The display panel feed and attachment head 30 is carried on the end of a shaft 32 to which it is rigidly connected. The shaft 32 is slidable within a swivel block 33 pivotally mounted to rotate about a fixed axis 34 which is also parallel to axes 21 and 31.

The swivel block 33 is located a short distance outside and at a position half way along the arc of travel of the end of the arm 20 which carries the display panel feed and attachment head 30. In its upper position, the end of the arm 20 which carries the head 30 lies adjacent a hopper 35 in which are stacked paperboard display panels 36 for attachment to the side of the crate 4. In its lower position, the same end of the arm 20 lies adjacent the side of the crate 4 to which the display panel is to be attached.

Referring now also to Figures 3 and 4, the display panel attachment head 30 comprises a generally rectangular plate 38 formed along one edge with a rectangular projection 39 in the same plane as the plate 38 itself. Projecting forwardly from the face of the plate 30 along the end edges of the rectangular projection

39 are a pair of chamfered positioning blocks 40 adapted to cooperate with apertures 41 in the side of the crate 4 to assist in accurate positioning of the head 30 relative to the crate 4. The plate 38 is formed with a pair of circular apertures 42, 43 through which project respective suction cups 44, 45. The dimensions of the plate 38 corresponds generally to the dimensions of the display panels 36, one of which is shown in broken lines in Figure 4 superimposed on the face of the plate 38 in the position in which it would be held in operation of the machine. Located behind each of the four corners of this display panel 36 is a bore 46 in the plate 38 through each of which a reciprocating push rod 50 operates under the control of a respective pneumatic cylinder 48.

The crate 4 and the display panels 36 are of the kind described in UK Patent Application No 8914727.6. Accordingly, each crate 4 is provided on opposite side walls with four generally key-hole shaped locking apertures (not shown) positioned to receive the four arrow-head shaped locking tabs 52 located at the corners of the display panel 36 and overlying the push rod bores 46 as seen in Figure 4. The function of the push rods 50 is to punch the locking tabs 52 of the display panel 36 into the locking apertures of the crate 4 whereby to detachably secure the panel to the side of the crate 4 in the manner described in said UK Patent Application No 8914727.6.

An operating cycle of a display panel attachment station 15 in applying display panels 36 to opposite sides of a crate 4 will now be described in greater detail, with particular reference to Figures 2 and 3, which illustrate the different positions of the parts of the mechanism during its operating cycle. As described earlier, crates 4 loaded with bottles 5 are transferred onto the workstation conveyor 2 two at a time where they are arrested by pneumatically operated stop 8 at a predetermined position. Actuation of bottle-lifting mechanisms 9, 9' then causes all twenty four bottles 5 in each crate 4 to be lifted clear of the floor thereof to reduce its weight and facilitate accurate positioning during application of the display panels 36.

Pneumatic cylinder 25 of the display panel attachment station 15 is then actuated to lower the bar 23 and thereby cause arm 20 to pivot about fixed axis 21 to its upper position as shown in Figures 2 and 3. As the arm pivots into this position, it causes the display panel feed and attachment head 30 to pivot about axis 31 in a clockwise direction (as shown in Figure 3) to bring the face of the plate 38 into face to face relationship with the lowermost display panel 36 of the stack of panels loaded into the hopper 35. Such pivoting of the attachment head 30 is achieved by virtue of the sliding coupling of the shaft 32 within the swivel block 34 which ensures that the axis of shaft 32 always intersects the stationary axis 34.

In this position of the display panel feed and

attachment head 30, the suction cups 44, 45 are in contact with the surface of the lowermost display panel 36 in the hopper 35 so that when suction is applied, this panel is securely retained by the suction cups in the correct position relative to the plate 38 as shown in Figure 4. Pneumatic cylinder 25 is then actuated to lift the bar 23 thereby causing the arm 20 to pivot clockwise about axis 31 from its upper to its lower, generally vertical position in which its lower end lies adjacent the side of the crate 4. During this pivotal movement of the arm 20, the display panel feed and attachment head 30 is caused to pivot anti-clockwise about axis 31, through the intermediate half-way position shown in which the axis of shaft 32 and of the arm 20 are aligned, until the arm 20 reaches its lower position, in which the face of the plate 38 is brought into face to face relationship with the side of the crate 4. As the head 30 reaches this position, the chamfered positioning blocks 40 which project forwardly of the plate portion 39 engage within cooperating rectangular apertures 41 in the sides of the crate 4 whereby to accurately position the crate relative to the attachment head 30. This process is greatly facilitated by action of the bottle-lifting mechanisms 9, 9' in reducing the weight of the crates 4.

With the head 30 properly aligned with the side of the crate 4, the four pneumatic cylinders 48 are then actuated to cause push rods 50 to punch the arrow-head shaped locking tabs 52 at the corners of the display panel 36 into cooperating keyhole shaped locking apertures in the side of the crate 4 thereby attaching the display panel thereto. Upon completion of this operation, the pneumatic cylinder 25 is actuated to lower the bar 23 to cause the arm 20 to withdraw the head 30 from the side of the crate 4. The bottle-lifting mechanism 9 is then actuated to lower the bottles 5 back into the crate 4, and the pneumatically operated stop 8 is lifted to permit the two crates to pass onto the outfeed conveyor 3.

It will be appreciated that although the above description of the construction and operation of the display panel attachment station 15 has been made with reference primarily to the more fully illustrated right hand side thereof, the construction and operation of the left hand side is identical to, albeit in mirror image, of the right hand side. Similarly, it will be appreciated that although only one of the stations 15, 15' has been described in detail, the construction and operation of both are identical, and both operate simultaneously. Furthermore, the invention is not limited to machines in which display panels are applied simultaneously to opposite sides of the crate. Single sided application is also possible, although the benefits of balanced reactive forces inherent in a two-sided arrangement are lost. Also, it is possible within the scope of the present invention to arrange any reasonable number of display panel attachment stations in tandem along the workstation conveyor even though only two are pro-

vided in the embodiment described above.

Claims

1. A machine for applying a panel (36) to the side wall of a bottle crate (4) comprises a workstation (15, 15') at which application of the panel (36) is effected, means including a panel feed and attachment head (30) pivotal towards and away from the workstation, actuating means (23, 24, 25) to move said pivotal means from a first position in which said head (30) can receive a panel from a supply (35) to a second position in which said head (30) can apply the panel to an adjacent side wall of a bottle crate (4) present at the workstation (15, 15') means (44, 45) to hold said panel on said feed and attachment head (30) between said first and second positions and means carried by said feed and attachment head (30) for securing said panel onto the crate side wall.
2. A machine as claimed in Claim 1 wherein said pivotal means comprises an arm (20) pivotal about a first axis (21) which arm (20) is pivotally connected to a shaft (32) at a second axis (31), which second axis is a constant distance away from said first axis along said arm, and where said shaft (32) is slidably connected to a swivel block (33), which swivel block is rotatable about a third axis (34) and wherein said attachment head (30) is attached to said arm (20) remote from said first axis (21).
3. A machine as claimed in Claim 1 or 2 which further comprises a bottle moving device which lifts the bottles present in a crate located at said workstation away from the base of said crate thereby reducing the effective weight of said crate at the workstation (15, 15').
4. A machine as claimed in Claim 3 wherein said bottle moving device comprises at least one rod for each bottle to be supported, which rod is raised through apertures in the base of said crate (4) and into contact with the underside of said bottle (5), the extent of movement of the rods being such as to raise the bottles from the base of the crate.
5. A machine as claimed in any of the preceding claims wherein said attachment head (30) further comprises a crate positioning means (40) adapted to adjust the relative position of the crate (4) and the attachment head so that the crate is in a position to receive a panel on either one of its side walls.
6. A machine as claimed in Claim 5 wherein said crate positioning means comprises a pair of chamfered blocks (40) which are inserted into at least one aperture (41) in said crate (4).
7. A machine as claimed in any of the preceding claims wherein said securing means comprise reciprocal push rods (50).
8. A machine according to any of the preceding claims wherein a pair of like panel feed and attachment heads (30) are provided one to one side of said workstation and one to an opposite side of said workstation and wherein said actuating means (23, 24, 25) is operable to pivot both of said panel feed and attachment heads so that a panel can be secured to each of two opposite side walls of said bottle crate.
9. A machine according to Claim 8, wherein said actuating means are operable to cause the said pair of panel feed and attachment heads to act simultaneously.
10. A machine according to any of the preceding claims wherein a plurality of display panel attachment stations are disposed in tandem along said workstation.

Fig.1.

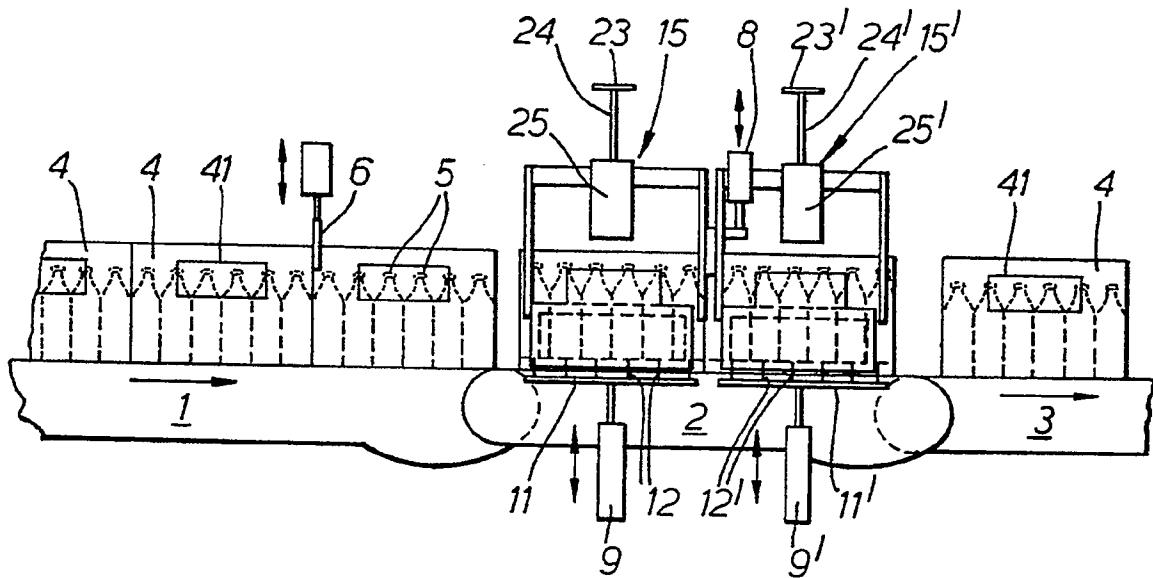


Fig. 2.

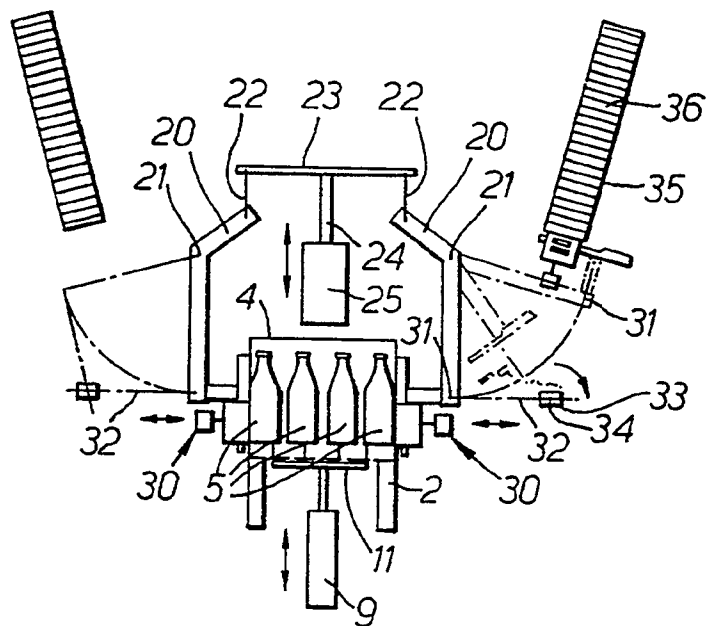


Fig.3.

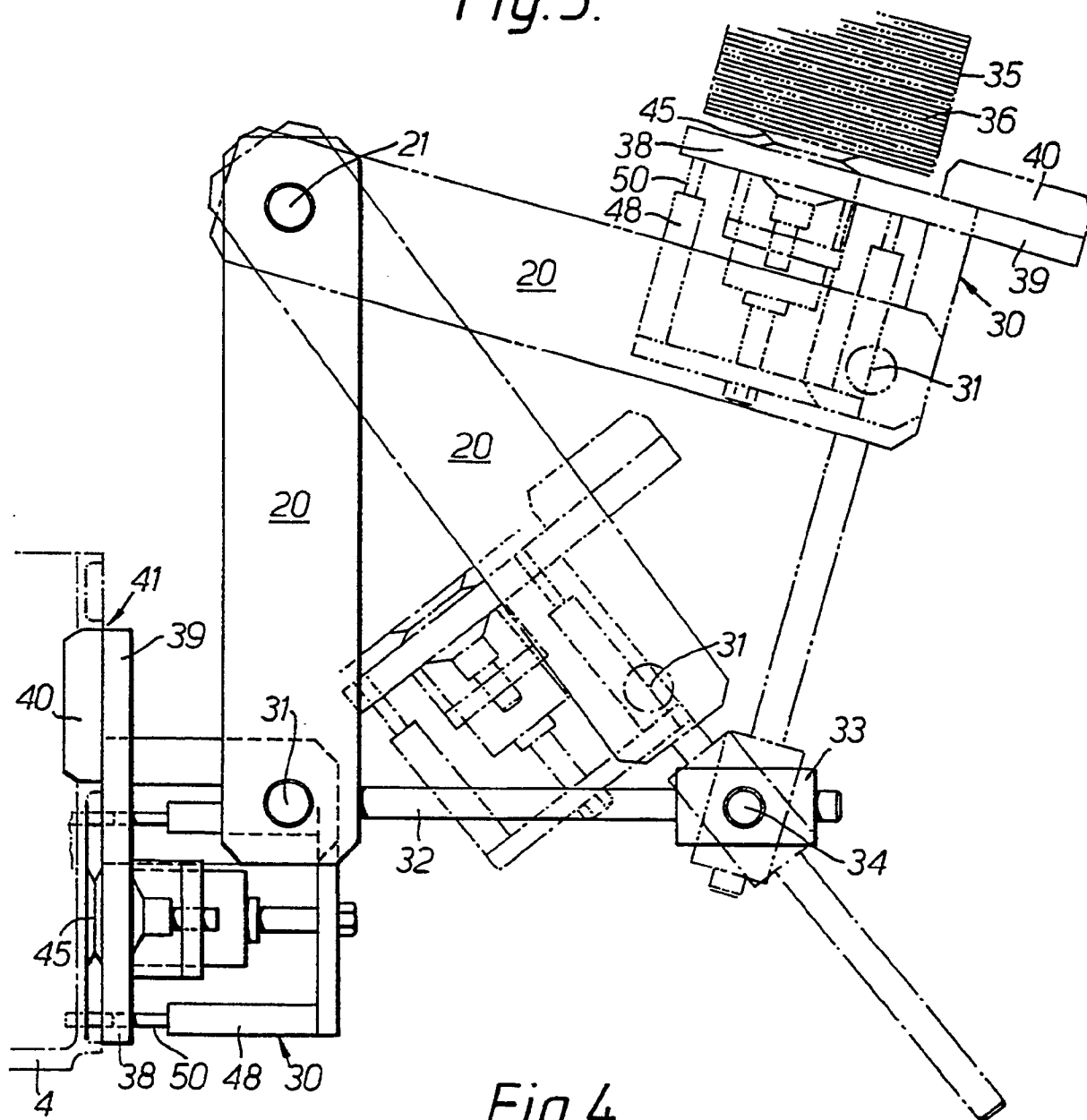


Fig.4.

