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Vorrichtung zum Anbringen von Identifizierungsabschnitten an Flaschenkästen

Dispositif pour l'application de feuillets d'identification sur des caisses à bouteilles

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(56) References cited:

EP-A- 0 174 649 **EP-A- 0 389 393**
WO-A-85/01861 **DE-U- 8 803 336**

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Description

This invention relates to a machine incorporating applicator means as defined in the preamble of claim 1 for applying a panel to the side wall of a bottle crate. The machine is particularly useful for detachably connecting display panels to opposed side walls of bottle crates.

EP-A-0 174 649 discloses a labelling system according to the preamble of claim 1 comprising a suction plate which uses a vacuum action to pick up an adhesive label by its printed surface. The suction plate is initially moved along a linear downward path using pneumatic cylinders to pick up a label, the plate is then retracted linearly before rotating it about a fixed axis by 90°. The plate is then moved along a linear horizontal path to affix the label on an object. Thus many pneumatic components are required to effect the discrete reciprocal vertical movement, the rotational movement and finally the reciprocal horizontal movement.

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 comprising reciprocal push rods carried by said feed and attachment head for securing said panel onto the crate side wall.

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 outfeed 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.

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.

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 to arrange any reasonable number of display panel attachment stations in tandem along the workstation conveyor even though only two are provided 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 characterised by means comprising reciprocal push rods (50) 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 according to any preceding claim wherein the push rods (52) are adapted to punch

locking tabs (52) provided on the panel (36) into cooperating locking apertures in the sides of the crate (4).

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.

Patentansprüche

1. Vorrichtung zum Anbringen eines Schildes (36) an der Seitenwand eines Flaschenkastens (4), mit einer Arbeitsstation (15, 15'), in der das Anbringen des Schildes (36) durchgeführt wird, Mitteln, die einen Schilderförder- und -anbringkopf (30) einschließen, der auf die Arbeitsstation zu und von ihr weg schwenkbar ist, Antriebsmitteln (23, 24, 25) zum Bewegen der schwenkbaren Mittel aus einer ersten Position, in der der Kopf (30) ein Schild aus einem Vortatsbehälter (35) empfangen kann, in eine zweite Position, in der der Kopf (30) das Schild an eine benachbarte Seitenwand eines in der Arbeitsstation (15, 15') befindlichen Flaschenkastens (4) anbringen kann, Mitteln (44, 45), um das Schild am Förder- und Anbringkopf (30) zwischen der ersten und zweiten Position zu halten, gekennzeichnet durch Mittel mit hin- und hergehenden Stoßstiften (50), die von dem Förder- und Anbringkopf (30) gehalten werden, zum Festmachen des Schildes an der Seitenwand des Flaschenkastens.
2. Vorrichtung nach Anspruch 1, bei der die schwenkbaren Mittel einen um eine erste Achse schwenkbaren Hebel (20) aufweisen, der schwenkbar mit einer Stange (32) an einer zweiten Achse (31) verbunden ist, die um einen konstanten Abstand längs des Hebels von der ersten Achse entfernt ist, wobei die Stange (32) verschiebbar in einem Schwenkblock (33) geführt ist, der um eine dritte Achse (34) drehbar ist, und wobei der Anbringkopf (30) entfernt von der ersten Achse (21) mit dem Hebel (20) verbunden ist.

3. Vorrichtung nach Anspruch 1 oder 2, außerdem umfassend eine Einrichtung zum Bewegen der Flaschen, die die Flaschen, die sich in einem in der Arbeitsstation angeordneten Kasten befinden, vom Betten des Kastens abhebt und dadurch das effektive Gewicht des Kastens in der Arbeitsstation (15, 15') reduziert. 5
4. Vorrichtung nach Anspruch 3, bei der die Einrichtung zum Bewegen der Flaschen für jede anzuhebende Flasche wenigstens einen Stab aufweist, der durch Öffnungen im Boden des Kastens (4) und in Kontakt mit der Unterseite der Flasche (5) angehoben wird, wobei das Maß der Bewegung der Stäbe so ist, daß die Flaschen vom Boden des Kastens abgehoben werden. 10
5. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei der Anbringkopf (30) außerdem eine Kasten-Positionier-Einrichtung (40) aufweist, ausgelegt um die gegenseitige Position von Kasten (4) und Anbringkopf auszurichten, so daß sich der Kasten in einer Position befindet, um ein Schild auf jeder seiner Seitenwände aufzunehmen. 20
6. Vorrichtung nach Anspruch 5, wobei die Kasten-Positionier-Einrichtung ein Paar angeschrägter Blöcke (40) aufweist, die in wenigstens eine Öffnung (41) im Kasten (4) eingeführt werden. 30
7. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Stoßstifte (50) ausgelegt sind, um am Schild (36) vorgesehene Befestigungsabschnitte (52) in entsprechende Befestigungsöffnungen in den Seiten des Kastens (4) einzustoßen. 35
8. Vorrichtung nach einem der vorhergehenden Ansprüche, bei der ein Paar gleicher Schilderförder- und -anbringköpfe (30) vorgesehen ist, eines auf der einen Seite der Arbeitsstation und eines auf der gegenüberliegenden Seite der Arbeitsstation, und bei der die Antriebsmittel (23, 24, 25) ausgelegt sind, um beide der besagten Schilderförder- und -anbringköpfe zu schwenken, so daß auf jeder der gegenüberliegenden Seitenwände des Flaschenkastens ein Schild angebracht werden kann. 40
9. Vorrichtung nach Anspruch 8, bei der die Antriebsmittel ausgelegt sind um zu bewirken, daß das Paar der Schilderförder- und -anbringköpfe gleichzeitig arbeitet. 50
10. Vorrichtung nach einem der vorhergehenden Ansprüche, bei der eine Mehrzahl von Anbringstationen für Kennzeichnungsschilder in Tandemanordnung entlang der Arbeitsstation angeordnet ist. 55

Revendications

1. Machine pour appliquer un panneau (36) sur la paroi latérale d'un casier à bouteilles (4), comprenant un poste de travail (15, 15') auquel est effectuée une application du panneau (36), des moyens comportant une tête (30) d'alimentation et de fixation de panneau et pouvant pivoter vers et à l'écart du poste de travail, des moyens de commande (23, 24, 25) pour déplacer les moyens pivotants depuis une première position dans laquelle la tête (30) peut recevoir d'une alimentation (35) un panneau jusqu'à une seconde position dans laquelle la tête (30) peut appliquer le panneau sur une paroi latérale adjacente d'un casier à bouteilles (4) présent à l'endroit du poste de travail (15, 15'), des moyens (44, 45) pour tenir le panneau sur la tête (30) d'alimentation et de fixation, entre les première et seconde positions, caractérisée par des moyens comprenant des tiges de poussée (50) à mouvement de va-et-vient et portées par la tête (30) d'alimentation et de fixation afin de fixer le panneau sur la paroi latérale du casier. 25
2. Machine suivant la revendication 1, caractérisée en ce que les moyens pivotants comprennent un bras (20) pivotant autour d'un premier axe (21), ce bras (20) étant connecté de façon pivotante à un arbre (32) à l'endroit d'un second axe (31), ce second axe étant écarté d'une distance constante du premier axe le long du bras, en ce que l'arbre (32) est connecté de façon coulissante à un bloc orientable (33), ce bloc orientable pouvant tourner autour d'un troisième axe (34), et en ce que la tête de fixation (30) est fixée au bras (20) à distance du premier axe (21). 30
3. Machine suivant l'une des revendications 1 et 2, caractérisée en ce qu'elle comprend en outre un dispositif de déplacement de bouteilles qui lève à l'écart de la base du casier les bouteilles présentes dans le casier situé à l'endroit du poste de travail, en réduisant par cela le poids effectif du casier à l'endroit du poste de travail (15, 15'). 35
4. Machine suivant la revendication 3, caractérisée en ce que le dispositif de déplacement de bouteilles comprend au moins une tige pour chaque bouteille à supporter, cette tige étant levée à travers des ouvertures dans la base du casier (4) et étant en contact avec le côté inférieur de la bouteille (5), l'ampleur du mouvement des tiges étant suffisant pour soulever les bouteilles de la base du casier. 40
5. Machine suivant l'une quelconque des revendications précédentes, caractérisée en ce que la tête de fixation (30) comprend en outre des moyens (40) de positionnement de casier adaptés pour ajuster la position relative du casier (4) et de la tête de fixation de façon que le casier soit en position pour recevoir 45

un panneau sur l'une ou l'autre de ses parois latérales.

6. Machine suivant la revendication 5, caractérisée en ce que les moyens de positionnement de casier comprennent une paire de blocs chanfreinés (40) qui sont insérés dans au moins une ouverture (41) du casier (4). 5
7. Machine suivant l'une quelconque des revendications précédentes, caractérisée en ce que les tiges de poussée (52) sont adaptées pour poinçonner des languettes de blocage (52), prévues sur le panneau (36), dans des ouvertures de blocage coopérantes, dans les côtés du casier (4). 10 15
8. Machine suivant l'une quelconque des revendications précédentes, caractérisée en ce qu'une paire de têtes (30) semblables d'alimentation et de fixation sont prévues l'une sur un côté du poste de travail et l'autre sur un côté opposé du poste de travail et en ce que les moyens d'actionnement (23, 24, 25) peuvent être actionnés pour faire pivoter les deux têtes d'alimentation et de fixation de panneau de façon qu'un panneau puisse être fixé sur chacune des deux parois latérales opposées du casier à bouteilles. 20 25
9. Machine suivant la revendication 8, caractérisée en ce que les moyens d'actionnement peuvent être actionnés pour amener la paire de têtes d'alimentation et de fixation de panneau à agir simultanément. 30
10. Machine suivant l'une quelconque des revendications précédentes, caractérisée en ce qu'une pluralité de postes de fixation de panneau d'affichage sont agencés en tandem le long du poste de travail. 35

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Fig. 1.

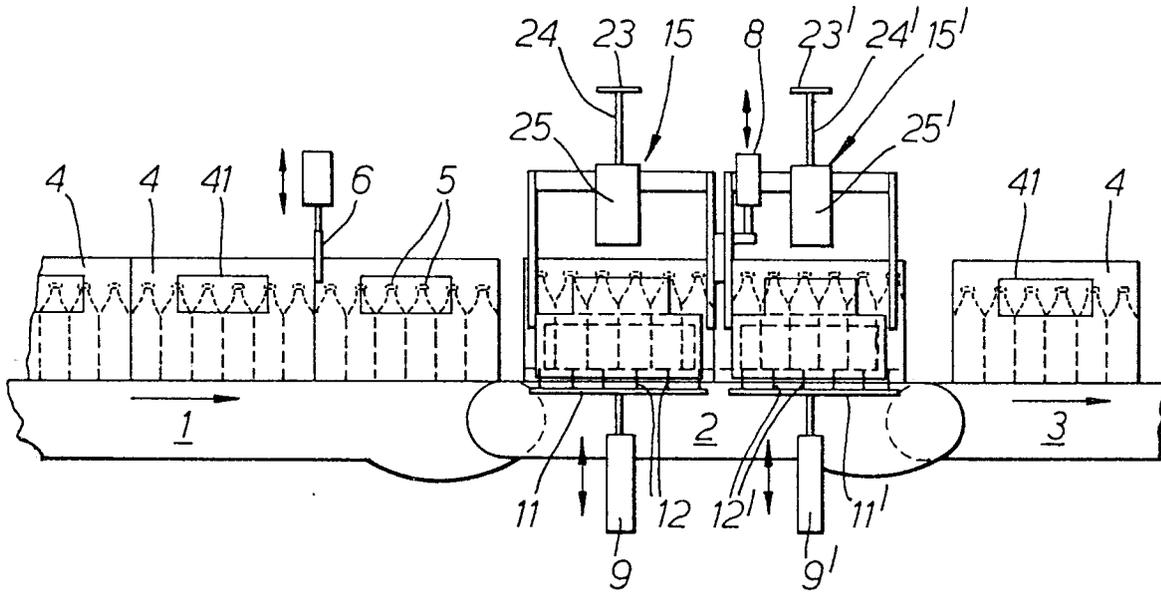


Fig. 2.

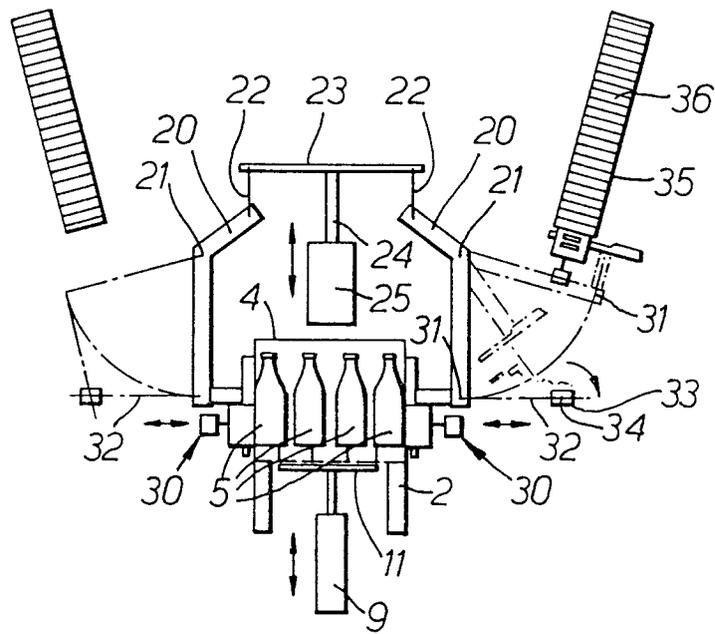


Fig. 3.

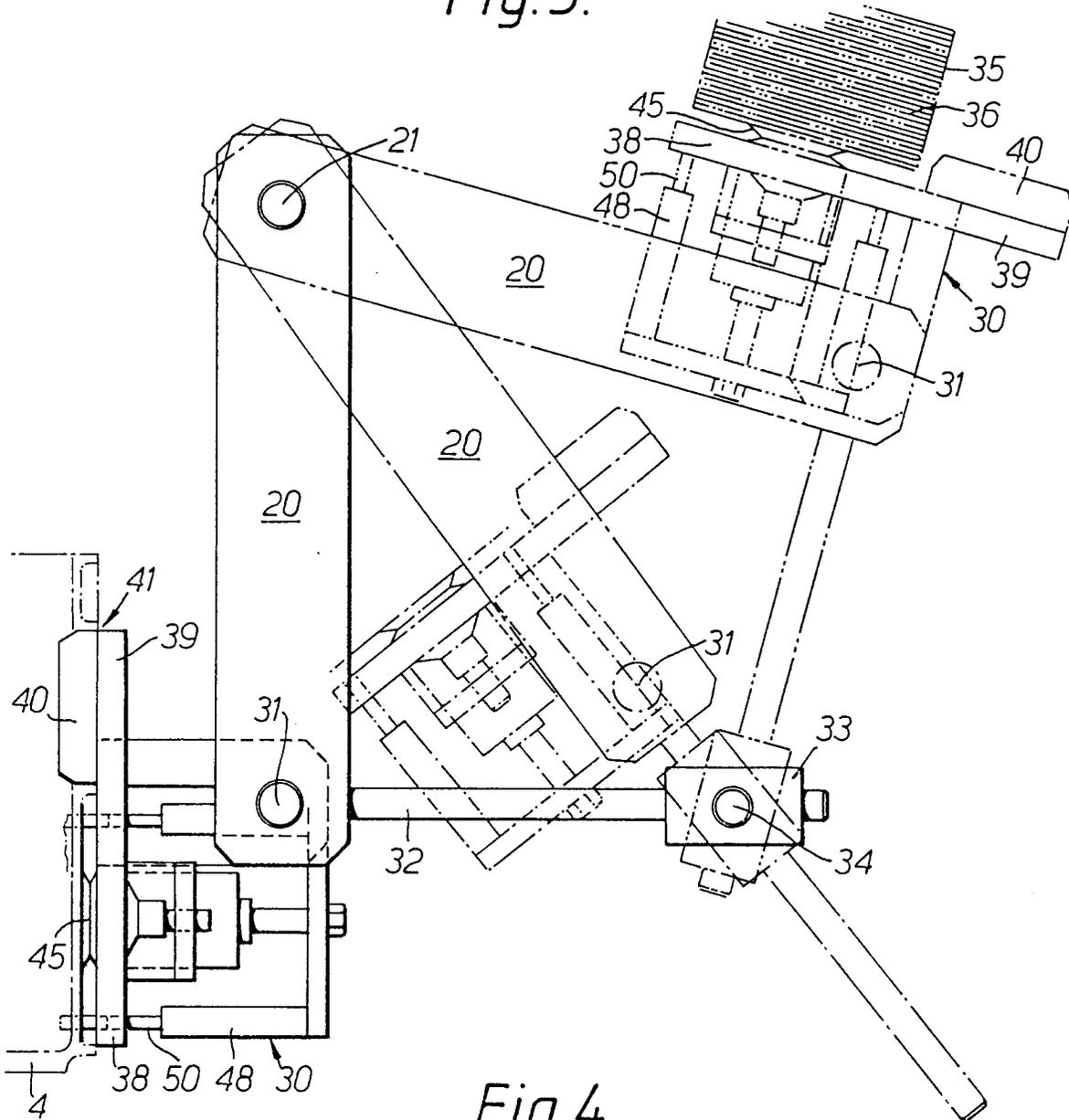


Fig. 4.

