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Device for automatically applying metal delivery mouths to packaging containers for products of fluid behaviour.

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Description

This invention relates to a device for automatically forming and applying metal delivery mouths to packaging containers for flowable products, in particular cardboard containers for powders. A device of this type is described for example in Italian patent 828,966.

In such devices the delivery mouths are formed from a metal strip and fed intermittently to a device, the purpose of which is to apply them to the boxes.

Said applicator device is formed structurally from a hammer and an anvil. The hammer comprises a cavity for receiving the formed delivery mouth, and is arranged to be moved, in synchronism with the anvil, into a position corresponding with the container in order to carry out the application of said mouth.

Machines of the type described in Italian patent 828,966 are large rotary machines of high productivity, and comprise a turntable carrying a plurality of said applicator devices each capable of successively applying the delivery mouths to the containers, which are continuously fed in an upright position by a suitable conveyor. There is however the practical need for a machine of lower productivity, able to be coupled to packaging machines into which the empty containers are conveyed in a lying position by spindles which move stepwise.

The object of the present invention is to satisfy the aforesaid need, and for this purpose the invention provides a device for automatically forming and applying metal delivery mouths to packaging containers for flowable products, of the type in which each mouth is formed from a metal strip by a forming unit and is fed to a complementary seat in an arm provided with a hammer which is arranged to apply the mouth to a respective container, characterised in that said arm is movable alternately between a vertical position in which the mouth is received in said seat from said forming unit by gravity, and a horizontal position in which said mouth is applied to a container, there being provided a positioning unit arranged to correctly locate the mouth in the seat, and sequential operating means for said unit and said arm.

The structural and operational characteristics of a device according to the present invention and its advantages will be more apparent from the description of one embodiment with reference to the accompanying diagrammatic drawings, in which:

Figure 1 is a perspective diagrammatic view showing, with the frame removed, the movement linkages for the device for forming and applying delivery mouths,

Figure 2 is a partial sectional elevation showing the loading of the feed mouth into the hammer cavity,

Figure 3 is a view of the device in the direction of the arrow F of Figure 2,

Figure 4 is a sectional detail showing the correct

positioning of the delivery mouth inside the hammer,

Figure 5 is the same view as Figure 3, showing the hammer disposed at the container, and ready to apply the delivery mouth,

Figure 6 is a partly sectional plan view of Figure 5, and

Figure 7 is the same view as Figure 6, but showing the delivery mouth positioned on the container.

With reference to the drawings, the device according to the invention is formed from a frame 10 carrying a forming unit indicated diagrammatically by 11 and of known type, arranged to form delivery mouths 12 from a metal strip 13.

The formed mouths 12 are fed one at a time to an underlying applicator device, indicated generally by 14, which offers them up to a cardboard container 15 and applies them thereto.

The applicator device 14 comprises an L-shaped arm 16 which swivels about 17 between the vertical position shown in Figure 3 and the horizontal position shown in Figure 5.

At the free end of the arm 16 there is provided a seat or cavity 9 in which a percussion head 19, commonly known as a hammer, slides on suitable guides 18. To provide its movement, said head 19 is articulated to one end of a bell crank lever 20 pivoted at 21 to the arm 16, and maintained in the position of Figure 2 by a spring 8. Said bell crank lever is oscillated by the rod 22 of a cylinder 23 fixed to the machine frame.

A positioning unit indicated generally by 24 cooperates with the described applicator device 14.

Said unit 24 is composed of a blade 25 and a pusher 26 which are rigid with each other and are carried by a slide 27 slidable on guides 28.

The blade 25 and respective pusher 26 are movable horizontally forwards and backwards between the positions shown in Figures 2 and 4. A locking device also cooperates with the applicator device, and consists of the rod 29 of a cylinder 30, said rod becoming inserted into two bores 31 of the arm 16, so as to lock it exactly and securely in said vertical and horizontal positions.

The containers 15 are mounted in a lying position on spindles 32 of a packaging machine (not shown) movable stepwise. In moving, said spindles 32 carry each container 15 against a counter-member 33 which is movable vertically in a guide block 34 between the lowered position of Figure 3 and the raised position of Figure 5. The oscillation of the arm 16 about 17, the horizontal movement of the positioning unit 24 and the vertical movement of the counter-member 33 are controlled in the correct sequence by means of a single control system.

This control system can for example comprise a drive shaft 35 with which there are rigid two plates 36 in which cam seats 37 are formed in order to provide, by means of lever systems, the abutting movement of the counter-member 33 and the oscillation of the arm 16 about 17 respectively.

By way of a bevel gear pair 38, said shaft 35 drives a second shaft 39 carrying a third plate 36 comprising a cam seat 37 which operates the positioning unit 24 by means of lever systems.

The operation of the device according to the invention is as follows.

The delivery mouths 12, formed by the forming unit 11, are made to fall one at a time into the underlying applicator device 14. More specifically, the mouth 12 falls into the cavity 9 (Figure 2) when the percussion head 19 is in its rest position, in which it is maintained by the action of the spring 8 on the bell crank lever 20.

The positioning unit 24, operated by the combination of the plate 36 with cam seat 37 driven by the shaft 39 and the respective lever systems, moves by virtue of the sliding of the slide 27 on the guides 28 until the blade 25 and the pusher 26, which is provided with elastic means, correctly position the mouth 12 against the percussion head 29 (Figure 4).

At this point the positioning unit returns to its initial position, and, after the cylinder 30 withdraws its rod 29 from the bore 31, the arm 16 rotates into the horizontal position of Figure 5 where it becomes locked by the insertion of the rod 29 of the cylinder 30 into the second bore 31 (Figure 6).

This rotation is operated by the lever systems connected to the plate 36 with cam seat 37 which is driven by the shaft 35. Before the rotation of the arm 16, the packaging machine (not shown) has already moved one of its spindles 32, on which a container 15 is disposed, into a position corresponding with the movable counter-member 33 when in its raised position (Figure 5).

The cylinder 23 is operated so that its rod 22 engages against the lever 20 pivoted at 21, to cause the percussion head 19 to slide on the guides 18.

This movement results in the application of the mouth 12 to the container 15, as can be seen from Figure 7.

The counter-member 33 is lowered inside the guide block 34, and the packaging machine rotates its spindle 32, which carries the container 15 to which the mouth 12 has been applied.

Simultaneously, the rod 22 of the cylinder 23 retracts, and the spring 8 returns the arm 20 and the head 19 connected to it into the rest position (Figure 6).

The rod 29 of the cylinder 30 withdraws from the second bore 31 and enables the arm 16 to return to the vertical position under the forming unit 11, where it is locked by the engagement of the rod 29 of the cylinder 30 in the first bore 31 (Figure 2).

At this point the cycle is repeated in order to apply a mouth 12 to a further container 15.

Claims

1. A device for automatically forming and applying metal delivery mouths to packaging containers for flowable products, of the type in which

each mouth is formed from a metal strip by a forming unit and is fed to a complementary seat (9) in an arm (16) provided with a hammer (19) which is arranged to apply the mouth to a respective container, characterized in that said arm (16) is movable alternately between a vertical position in which the mouth (12) is received in said seat (9) from said forming unit by gravity, and a horizontal position in which said mouth (12) is applied to a container (15), there being provided a positioning unit (24) arranged to correctly locate the mouth (12) in the seat (9), and sequential operating means for said unit and said arm.

2. A device as claimed in claim 1, characterized in that said movable arm (16) comprises at one end a seat (9) in which a percussion head (19) slides in a guided manner (18) under the action of the end of a lever (20) which is pivoted to the arm (16) and is moved by operating means which act on its other end and are separated from this latter.

3. A device as claimed in claim 2, characterized in that said arm is an L-shaped arm (16) movable between the vertical position and horizontal position about a pivot (17), and is locked in said positions by the rod (29) of a cylinder (30), which becomes inserted into bores (31) provided in the arm portions of the L-shaped arm (16).

4. A device as claimed in claim 2, characterized in that said lever (20) is caused to swivel, in the horizontal position, by the rod (22) of a cylinder (23) which is connected to the load-bearing structure.

5. A device as claimed in claim 1, characterized in that said positioning unit (24) is constituted by a blade (25) and a pusher (26) which are rigid with each other and are driven by operating means.

6. A device as claimed in claim 5, characterized in that said blade (25) and said pusher (26) are located on a slide (27) which is slidable on guides rigid (28) with the structure and is driven by operating means.

7. A device as claimed in claim 1, characterized by comprising a counter-member (33) movable vertically in a guide (34) between a raised position and a lowered position and cooperating during the hammer percussion stage with the container (15), which is carried by a packaging machine spindle (32).

8. A device as claimed in claims 1, 2, 5, and 7, characterized in that said movable arm (16), said positioning unit (24) and said counter-member (33) are moved in the correct sequence by a single control system which operates cams (37) for controlling the succession of movements.

Patentsprüche

1. Vorrichtung zum automatischen Herstellen und Anbringen von metallischen Gießstutzen an Verpackungsbehältern für fließfähige Produkte von jener Art, in welcher jeder Gießstutzen durch eine Verformungseinheit aus einem Metallstreifen geformt und einem komplementären Sitz (9) in einem Arm (16) zugeführt wird, der mit einem Hammer (19) ausgestattet ist, der so ange-

ordnet ist, daß er den Gießstutzen an einen zugehörigen Behälter anbringt, dadurch gekennzeichnet, daß der Arm (16) alternierend zwischen einer Vertikallage, in welcher der Gießstutzen (12) aus der Verformungseinheit unter Schwerkraftwirkung von dem Sitz (9) aufgenommen wird, und einer Horizontallage, in welcher der Gießstutzen (12) an einem Behälter (15) angebracht wird, bewegbar ist, wobei eine Positioniereinheit (24) zum richtigen Ablegen des Gießstutzens (12) im Sitz (9) und eine Arbeitsfolgesteuerung für diese Positioniereinheit und den Arm vorgesehen ist.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß der bewegbare Arm (16) an einem Ende einen Sitz (9) aufweist, in welchem ein Schlagkopf (19) in geführter Weise (18) unter der Wirkung des Endes eines Hebels (20) gleitet, der an den Arm (16) angelenkt ist und der durch Betätigungsorgane bewegt wird, die auf dessen anderes Ende wirken und von diesem letzteren getrennt sind.

3. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß dieser Arm ein um eine Drehachse (17) zwischen einer Vertikallage und einer Horizontallage bewegbarer L-förmiger Arm (16) ist und in diesen Stellungen durch die Stange (29) eines Zylinders (30) verriegelbar ist, welche in in den Armteilen des L-förmigen Armes (16) vorgesehene Bohrungen (31) eingeführt wird.

4. Vorrichtung nach Anspruch 2, dadurch gekennzeichnet, daß der Hebel (20) in Horizontalstellung durch die Stange (22) eines mit dem kraftaufnehmenden Aufbau verbundenen Zylinders (23) verschwenkt wird.

5. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß die Positioniereinheit (24) von einer Klinge (25) und einem Stößel (26) gebildet ist, welche miteinander starr verbunden sind und von Betätigungsorganen angetrieben werden.

6. Vorrichtung nach Anspruch 5, dadurch gekennzeichnet, daß die Klinge (25) und der Stößel (26) auf einem Schlitten (27) vorgesehen sind, der auf mit dem Aufbau starr verbundenen Führungen (28) gleitend verschiebbar ist und durch Betätigungsorgane angetrieben wird.

7. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß sie ein Zählglied (33) aufweist, welches in einer Führung (34) zwischen einer angehobenen Stellung und einer abgesenkten Stellung vertikal beweglich ist und während der Hammeraufschlagphase mit dem Behälter (15) zusammenwirkt, der von einer Verpackungsmaschinenspindel (32) getragen wird.

8. Vorrichtung nach den Ansprüchen 1, 2, 5 und 7, dadurch gekennzeichnet, daß der bewegbare Arm (16), die Positioniereinheit (24) und das Zählglied (33) durch ein einziges Steuersystem, welches die Aufeinanderfolge von Bewegungen steuernde Nocken (37) betätigt, in der richtigen Reihenfolge bewegt werden.

Revendications

1. Dispositif pour former et appliquer auto-

matiquement des becs verseurs métalliques sur des récipients d'emballage pour produits fluides, du type dans lequel chaque bec est formé en partant d'une bande de métal par une unité de formage et est amené à un siège complémentaire (9) prévu dans un brad (16) muni d'un marteau (19) qui est conçu pour appliquer le bec à un récipient respectif, caractérisé par le fait que le bras (16) peut se mouvoir alternativement entre une position verticale dans laquelle le bec (12) venant de l'unité de formage se loge par gravité dans le siège (9) et une position horizontale dans laquelle le bec (12) est appliqué à un récipient (15), une unité de positionnement (24) étant prévue et conçue de manière à mettre correctement en place le bec (12) dans le siège (9), et des moyens d'actionnement successif de l'unité et du bras étant prévus.

2. Dispositif selon la revendication 1, caractérisé par le fait que le bras mobile (16) comprend à une extrémité un siège (9) dans lequel une tête de percussion (19) glisse d'une façon guidée (18) sous l'action de l'extrémité d'un levier (20) qui est articulé au bras (16) et est déplacé par des moyens d'actionnement qui agissent sur son autre extrémité et sont séparés de cette dernière.

3. Dispositif selon la revendication 2, caractérisé par le fait que le bras est un bras en L (16) mobile entre la position verticale et la position horizontale autour d'un pivot (17) et est bloqué dans ces positions par la tige (29) d'un cylindre (30), qui s'insère dans des perforations (31) prévues dans les parties de bras du bras en L (16).

4. Dispositif selon la revendication 2, caractérisé par le fait que le levier (20) est amené à pivoter, dans la position horizontale, par la tige (22) d'un cylindre (23) qui est relié à la structure supportant la charge.

5. Dispositif selon la revendication 1, caractérisé par le fait que l'unité de positionnement (24) est constituée par une lame (25) et un poussoir (26) qui sont reliés rigidement entre eux et sont entraînés par des moyens d'actionnement.

6. Dispositif selon la revendication 5, caractérisé par le fait que la lame (25) et le poussoir (26) sont situés sur un coulisseau (27) qui peut coulisser sur des guides (28) reliés rigidement à la structure et est entraîné par des moyens d'actionnement.

7. Dispositif selon la revendication 1, caractérisé par le fait qu'il comprend un élément complémentaire (33) mobile verticalement dans un guide (34) entre une position levée et une position abaissée et coopérant, pendant le stade de percussion du marteau, avec le récipient (15) qui est porté par une broche (32) de machine à emballer.

8. Dispositif selon les revendications 1, 2, 5 et 7, caractérisé par le fait que le bras mobile (16), l'unité de positionnement (24) et l'élément complémentaire (33) sont déplacés dans l'ordre correct par un seul système de commande qui actionne des cames (37) pour commander la succession de mouvement.

Fig.1

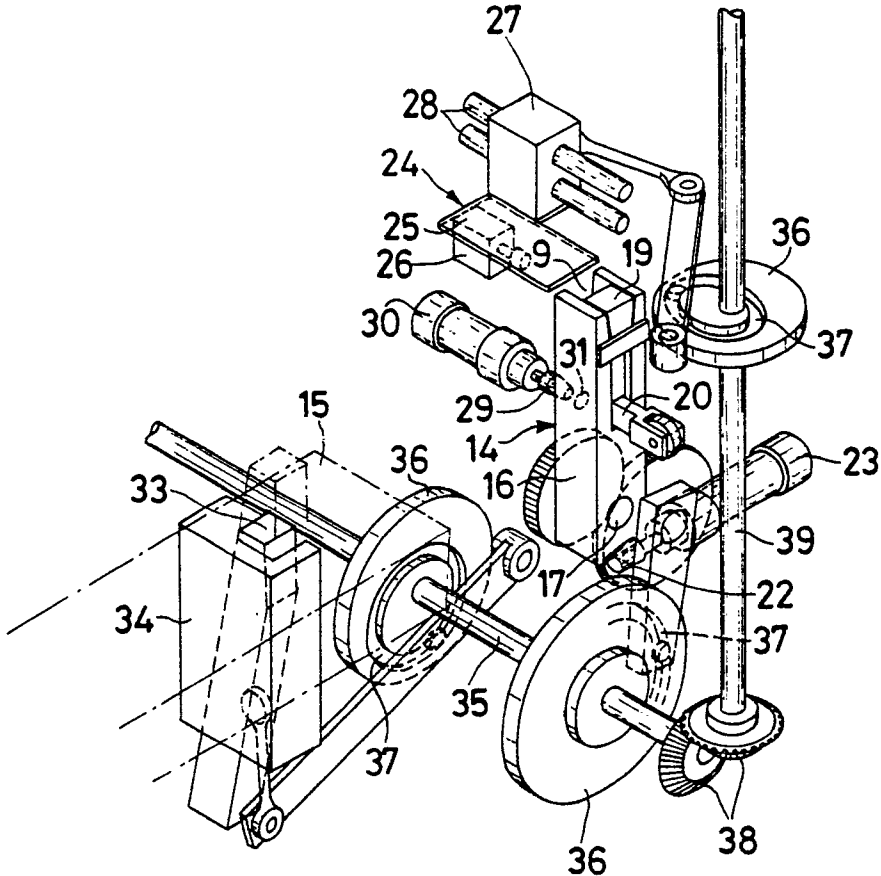


Fig.2

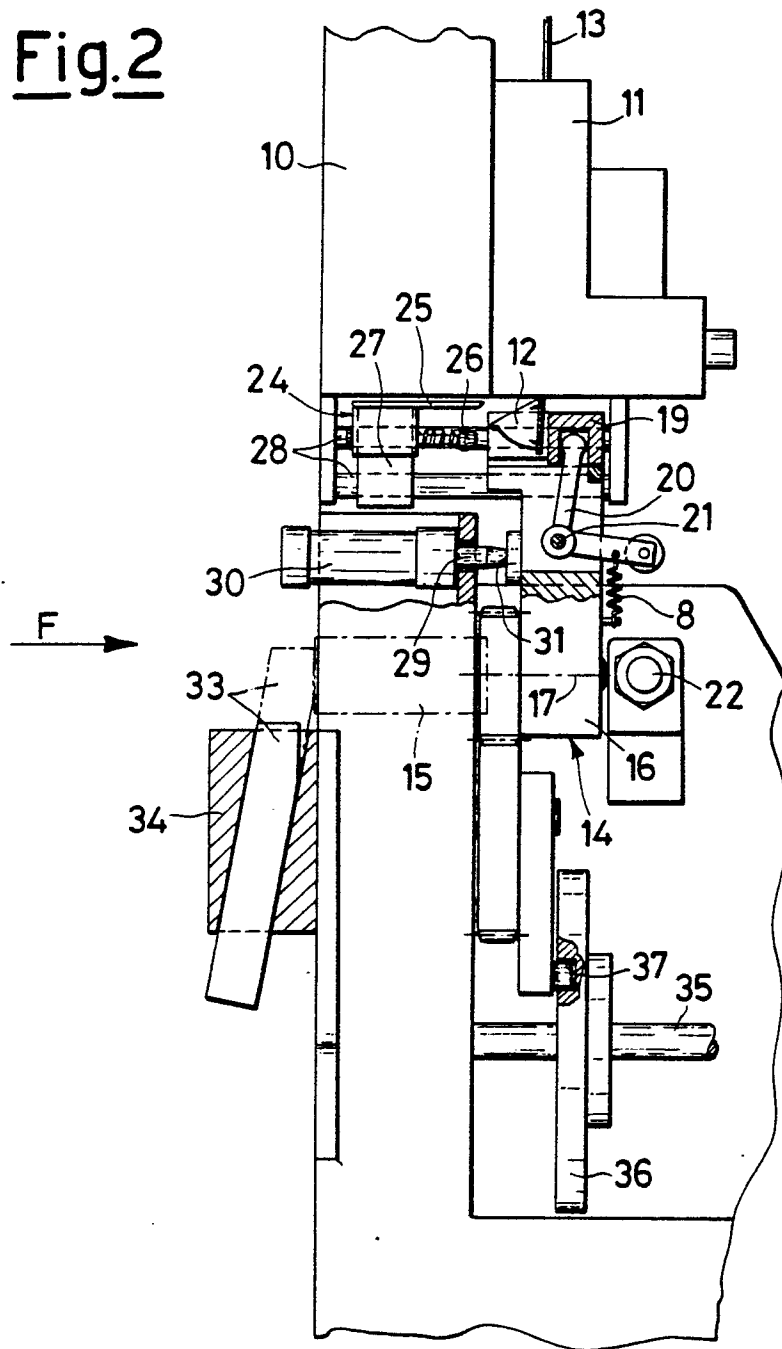


Fig.3

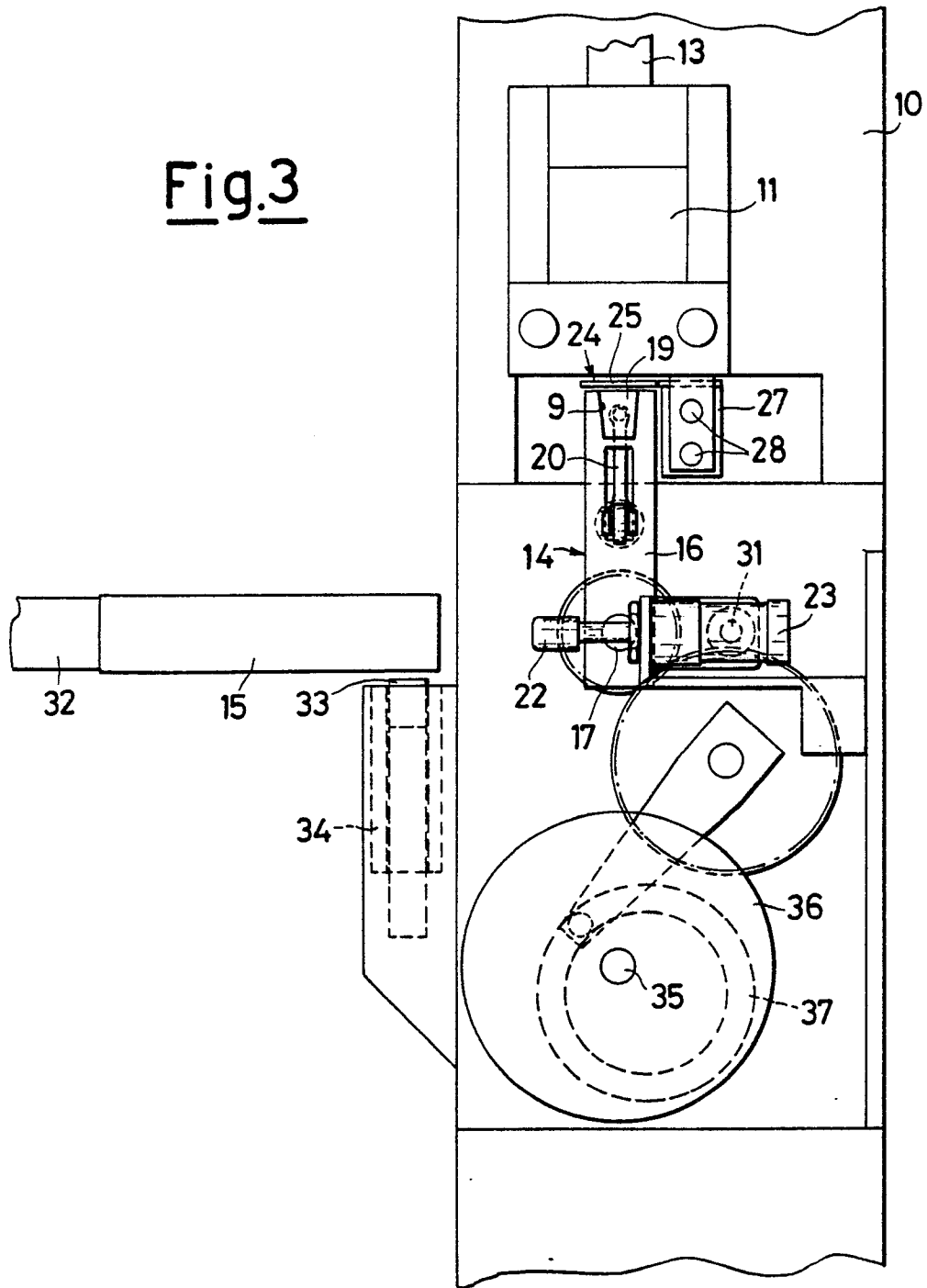


Fig.4

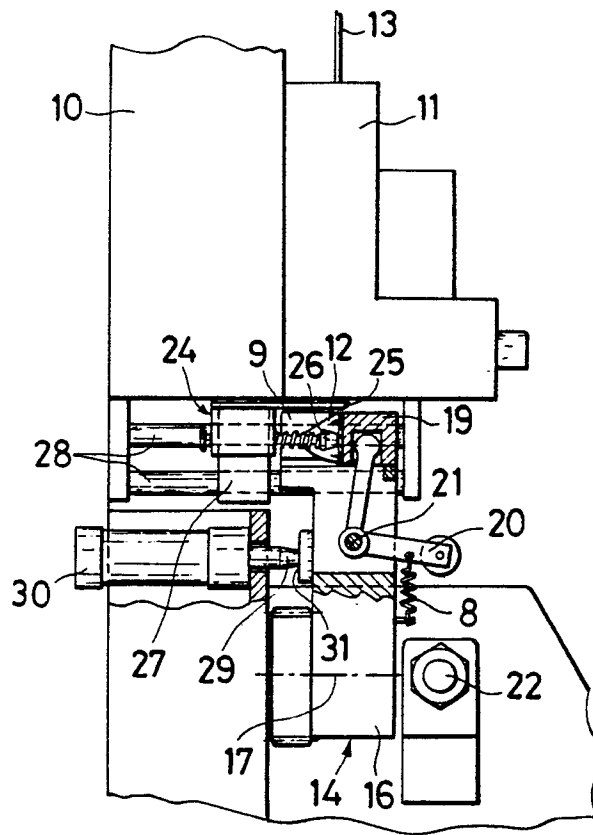


Fig.5

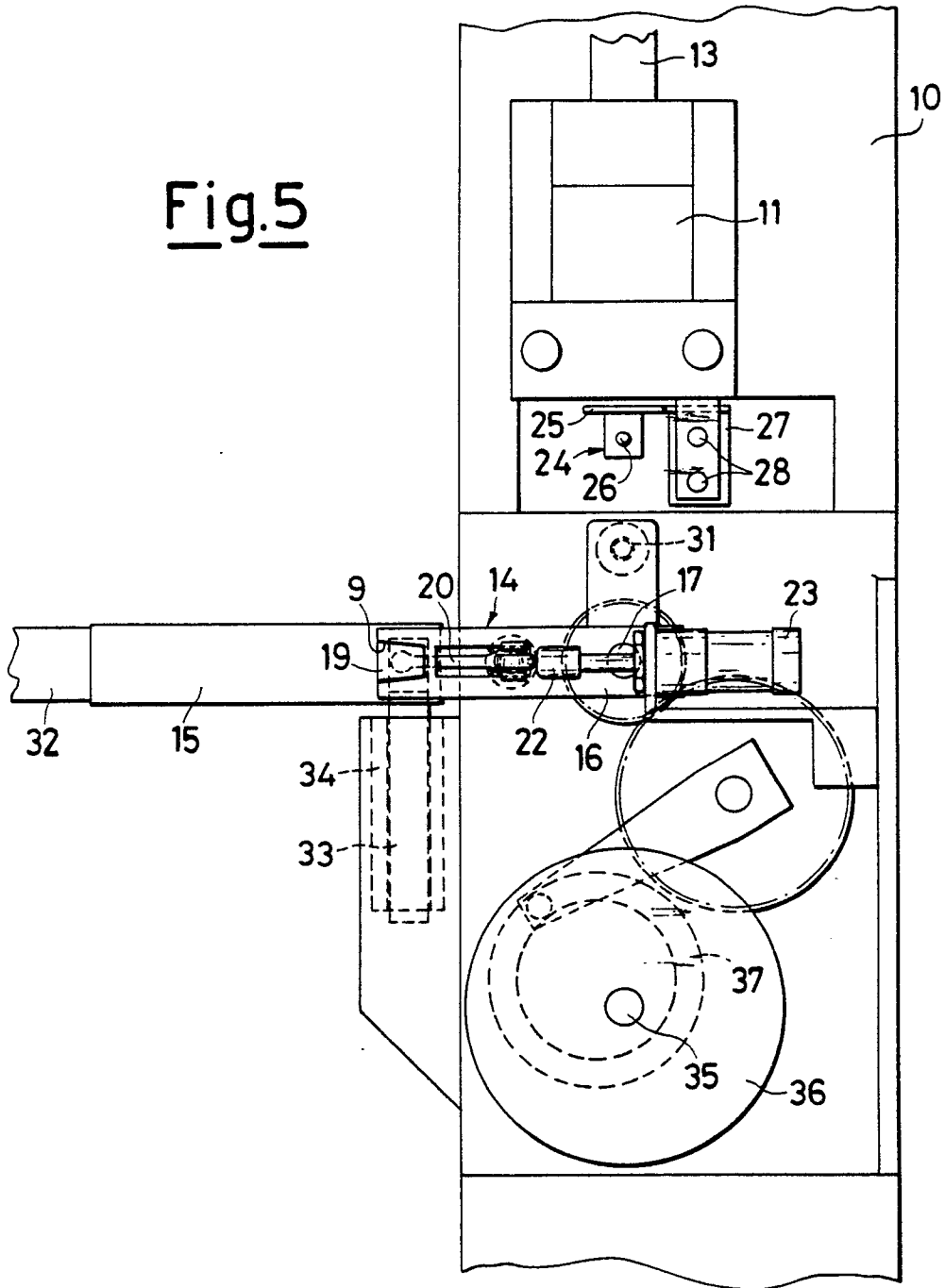


Fig.6

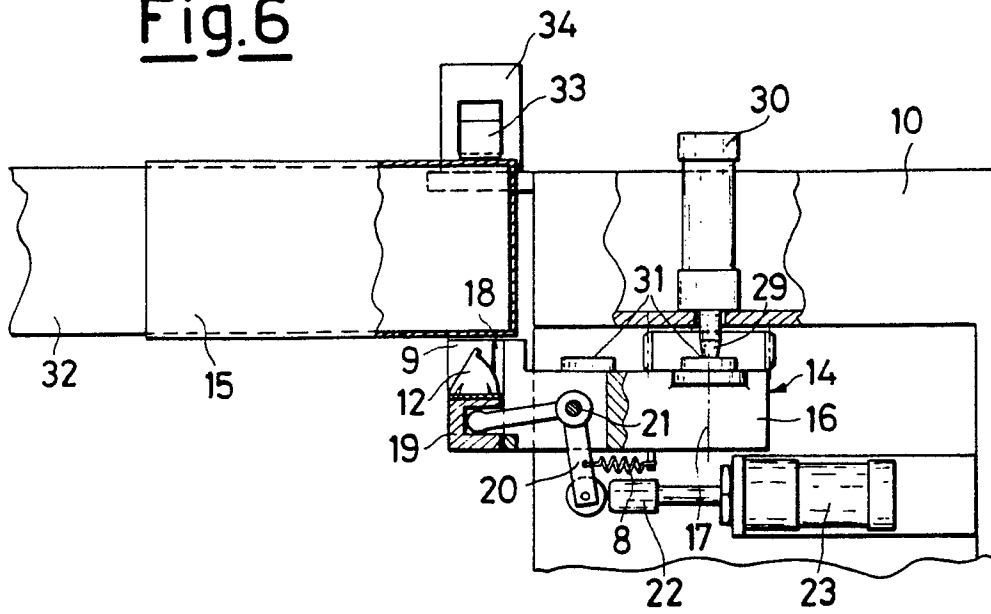


Fig.7

