(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 027 675**
A1

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **80200983.7**

(22) Date of filing: **17.10.80**

(51) Int. Cl.³: **B 24 D 7/00**
B 30 B 15/30

(30) Priority: **22.10.79 IT 2668879**

(43) Date of publication of application:
29.04.81 Bulletin 81/17

(84) Designated Contracting States:
AT BE CH DE FR GB LI LU NL SE

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(54) **Automatized press for moulding grinding wheels.**

(57) An automatized press is disclosed for moulding grinding wheels containing two or more reinforcing gauzes, a metallic hub for the central wheel bore and possibly a marking label, said press having, associated therewith a first set of pincers (35) which are intended for automatically feeding said gauzes to the moulds together with the hub and the marking label, and a second set of pincers (135) intended for automatically removing from the moulds the as moulded grinding wheels (D), said second set also comprising a suction apron (49) for cleaning the bottom platen (10) of the press.

EP 0 027 675 A1

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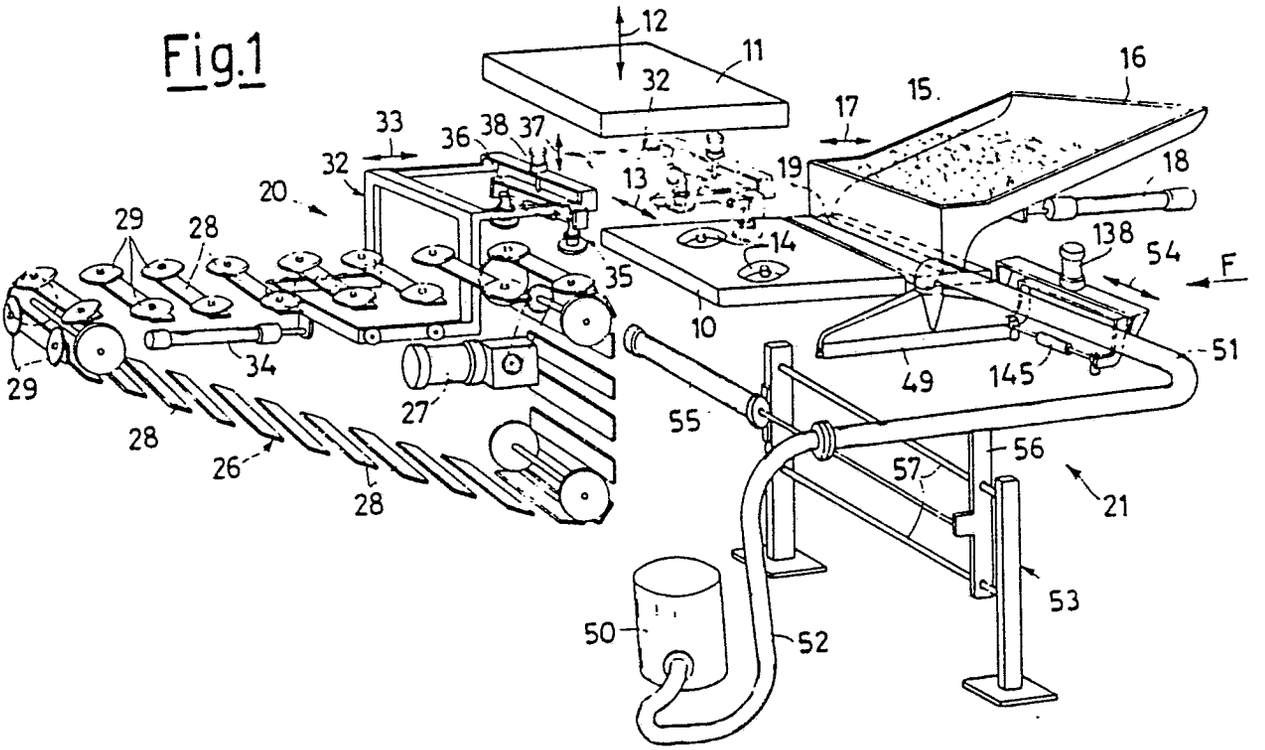
Croydon Printing Company Ltd.

Fig.1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AUTOMATIZED PRESS FOR MOULDING GRINDING WHEELS . -

This invention relates to a moulding press, operated in an entirely automatic fashion, which is employed very advantageously in the moulding of grinding wheels, of the kind which contain two or more reinforcing gauzes made of wowen fabric, for example resin-impregnated fiberglass.

The conventional moulding presses for the use referred to above are semi-automatic in operation and this fact implies a continuous and cumbersome work for the operator in order that a commercially significant production may be achieved, so that the output is always a function of random factors.

As a matter of fact, the operator is requested manually to load on the press bottom platen, which usually holds two moulds, the reinforcing gauzes, the metallic hub for the wheel bore and also the marking label which identifies the manufacturer and usually bears the wheel standard markings.

As a result, the times required for feeding the abrasive mix to the moulds and for moving the press bottom platen from the pressing position to the mould loading position are closely bound to the manual steps referred to above and must be calculated so as to leave certain lag times for the operator.

Consequently, the press is not exploited to the maximum of its potential output.

In addition, the work of the operator, in spite of the time allowances referred to above still remains cumbersome.

An object of the present invention is to do away with the shortcomings referred to above by providing a press in which the abrasive mix, the reinforcing gauzes, the wheel hub and the marking label are charged in the moulds in a completely automatic sequence so that the potential output of the press can be exploited to the utmost irrespective of the performance of the individual press attendants.

To achieve this object it has been envisaged, according to the present invention, to provide an automatic press for moulding grinding wheels incorporating two or more reinforcing gauzes, a metallic wheel hub on the wheel bore and possibly a marking label, said moulding press being of the type comprising :

- two platens, a bottom one and a top one, carrying at least one male mould and a female mould, the bottom plate being horizontally withdrawable from the press towards a position adapted to load in the mould the abrasive mix, the gauzes, the wheel hub and possibly the marking label, said press being characterized in that it comprises, in combination, a first unit for automatically feeding into the mould the gauzes, the wheel hub and the possible label, and a second unit for automatically removing from the mould the as-moulded grinding wheel, said first unit comprising, in its turn, a stepwise-going conveyor carrying at least a row of dishes, each dish having a central plug which can be retracted against the bias of a spring, and a translation carriage which is

reciprocable between said conveyor and said mould and carrying at least an expansion pincer which is vertically movable in constant alignment with the plug of a dish, said second unit comprising at least an expansion pincer which can be moved both vertically and horizontally between said mould and a position outside the press.

The functional and structural features of the invention and its advantages over the prior art will be better understood with reference to the exemplary description of an embodiment, with reference to the accompanying drawings, wherein :

FIGURE 1 is a perspective view showing a press which embodies the principles of this invention.

FIGURES from 2 to 8 inclusive are detail views which show the several working steps of the machine.

FIGURE 9 is an end view taken along the arrow F of FIGURE 1 with parts removed and shown in cross-section for the sake of clarity, and

FIGURE 10 is an exploded view showing a grinding wheel.

Having now reference to the drawings, the press in question, in its general layout, is of a conventional kind well known to those skilled in the art and which comprises a bottom platen 10 and a top platen 11. The platens 10 and 11 carry, respectively, the male and the female moulds used for shaping the grinding wheels. The top platen 11 is vertically movable in the direction of the arrow 12, whereas the bottom platen 10 is horizontal-

ly movable in the direction of the arrow 13. Thus, the platen 10 is shifted from a working position of shaping of the grinding wheel, in alignment with the platen 11, to a position of mould loading and unloading, wherein the platen 10 is offset relative to the platen 11 in a position outside the press, as shown in FIGURE 1. The abrasive mix is loaded into the moulds 14 in the conventional way by means of a hopper 16 which is moved horizontally in the direction of the arrow 17 by means of an actuating ram 18. The mix 15 is deposited by gravity onto the platen 10 and emerges through a slot 19.

According to the present invention, the quite conventional press briefly described above is associated with two sets, which, in FIGURE 1 of the drawings, are generally indicated at 20 and 21, respectively.

The set 20 is intended automatically to feed the moulds 14 with the gauzes 22 to reinforce the abrasive mix, a wheel hub 23 for the central wheel bore of the wheel D and a marking label 25 (FIGURE 10).

The set 21, conversely, is intended automatically to remove, from the moulds 14, the finished grinding wheel D (FIGURE 8).

The set 20 is structurally composed by a slat conveyor 26 which is fed forward stepwise by a motor 27. Each slat 28 of the conveyor 26 carries a couple of dishes 29. With reference to the detail views of FIGS. 2 and 3, each dish 29 has a central plug 30, which can be retracted against the bias of a spring 31. The conveyor 26

has, cooperating therewith, a translational carriage 32 which, by the agency of an actuating ram 34, is reciprocated in the direction of the arrow 33 between the withdrawn and outstretched positions shown in FIGURES 1 and 5, respectively.

The carriage 32 carries a couple of pincers 35 of the expansion type (FIGURES from 2 to 5), mounted on a frame 36 which can be lifted and lowered in the direction of the arrow 37 by the agency of an actuating ram 38.

Each pincer 35 comprises two arms 39, 40 pivotally connected at 41. The arm 39 is fastened to the frame 36, whereas the arm 40 can be rotated about 41 against the bias of a spring 42. The concurrent rotation of the arms 40 of the couple of pincers 35 is controlled by the stems 43 of two confrontingly assembled pistons 44 displaceable in the interior of a ram 45 against the bias of springs 46. Each pincer 35, in addition, is surrounded by a sleeve 47, the latter being axially slidable and terminated by a flange 48, the purpose of which will be explained hereinafter.

The set 21 is structurally comprised of a suction apron 49, which is connected to a suction pump 50 through a stiff tube 51 and a hose 52. The suction apron 49 is as wide as the platen 10 and has a comparatively narrow suction slot. The stiff tube 51 is borne by a framing 53 and is movable in the direction of the arrow 54 by the agency of an actuating ram 55. More detailed-

ly, the tube 51 is borne by an upright 56 slidable on ways 57 which overhangingly extend from the framing 53. The tube 51 in its shank close to the apron 49 carries, moreover, a couple of pincers 135 which, both as to their structure and their operability, are substantially a counterpart of the pincers 35 of the set 20 described hereinabove. The only difference is that the pincers 135 do not have the sleeve 47 or the relevant flange 48, either. The component parts of the pincers 135, depicted in FIGURES 6, 7, 8 and 9, will not be described in detail and carry the same numerical references as the pincers 35 but increased by 100.

It is thus apparent that the apron 49 and the pincers 135, integral with the tube 51, are moved between the position of FIGURES 6, 7 and 8, wherein the finished wheels are removed and the platen 10 cleaned, and the position of FIGURE 9, wherein the finished wheels are unloaded, for example onto a conveyor 58 which forwards them to a storing station.

The operation of the subject press is apparent from the foregoing, but, briefly stated, is as follows.

The operator deposits on a couple of dishes 29 the hub 23, possibly the label 25, and the gauze 22 (FIGURE 2) and, on the next oncoming dish coupled 29 a gauze 22 only, and so forth in the same alternate sequence. The conveyor 26 is moved stepwise so as to bring each couple of dishes 29 with their charge into alignment with the couple of pincers 35 of the carriage 32

(FIGURE 2).

Let this motion be considered in relationship with the first couple of dishes 29 carrying the hub 23, the label 25 and the gauze 22.

The pincers 35 are lowered from the position of FIGURE 2 to that of FIGURE 3 so as to become inserted into the assembly 23, 25 and 22, by axial depression of the plug 30 and relative motion between the pincers 35 and the respective flanges 48.

The pincers 35 are then closed from the position of FIGURE 2 to the position of FIGURE 3 and lifted to the position of FIGURE 4.

The carriage 32 is then moved from the position shown in FIGURE 1 in dotted lines (also shown in the detail of FIGURE 4).

During this motion, the flange 48, by axially pressing against the assembly 23, 25, 22 ensures the centering of the latter relative to the plug 59 of the movable bottomwall 60 of the mould 14 (best seen in FIGURE 4).

The pincers 35 are then lowered to the position of FIGURE 5 and opened, so as to place on the bottom wall 60 the assembly 23, 25, 22.

At this stage, in a manner known per se, the moulds 14 are filled with the abrasive mix 15 by shifting the hopper 16 in the direction of the arrow 17. Within the mould 14, atop the mix 15, a second gauze 32 is placed, which has been withdrawn from the dishes 29 by the pincers 35 in the same way as described above with refe-

rence to the assembly 23, 25, 22.

The platen 10 is then moved under the platen 11, the mix is compressed and the platen 10 is brought back to the position of FIGURE 1, outside the press, for withdrawing the finished grinding wheels.

To this purpose, the set 21 has been shifted to the position shown in dash and dot lines in FIGURE 9 and the pincers 135, which are open, are lowered from the position of FIGURE 6 to the position of FIGURE 7 wherein they are closed on the central bore of the moulded wheel after that the bottom wall 60 has been lifted (by extractor of conventional make, not shown) to prevent any interference by the plug 59.

The pincers 135 are then lifted to the position of FIGURE 8 and carry with themselves the finished grinding wheel D. The set 21 is eventually brought back to the position of FIGURE 9 on the conveyor 58 onto which the wheels are deposited as the pincers 135 are opened.

During this reciprocation of the set 21, the suction apron 49 provides to sweep out of the platen 11 the residues of abrasive flour, thus preventing it from becoming airborne and from causing any damage to the attendants.

For each couple of grinding wheels there are repeated, of course and in the same sequential order, the steps which have been described hereinabove.

Thus the object indicated in the introductory portion of this specification is achieved in a simple and

extremely functional and the advantages stemming therefrom are apparent.

While the invention has been shown and described in connection with the moulding of two grinding wheels at a time, the same basic principles can as well be applied for moulding a single wheel or more than two wheels. In addition, also the number of reinforcing gauzes for each wheel can be varied without departing from the scope of the invention.

C L A I M S :

1. An automatic press for moulding grinding wheels incorporating two or more reinforcing gauzes, a hub for the wheel central bore and possibly a marking label, the press being of the kind comprising a bottom platen and a top platen which carry, respectively, at least a male and a female mould for shaping the wheel, the bottom platen being horizontally withdrawable from the press to a position adapted to load the abrasive mix into the mould together with the gauzes, the hub and possibly the label, said press being characterized in that it comprises, in combination, a set (20) for automatically loading into the mould (14) the gauzes (22), the hub (23) and the possible label (25), and a set (21) for automatically removing from the mould (14) the moulded grinding wheel (D), said set (20) comprising : a conveyor (26) movable stepwise and carrying at least one row of dishes (29) each of which has a central plug (30) which can be retracted against the bias of a spring (31) and a translational carriage (32) movable reciprocally between said conveyor (26) and said mould (14) and carrying at least one expansion pincer (35) movable vertically in constant alignment with the plug (30) of a plate (29), said set (21) comprising at least an expansion pincer (135) vertically movable and also horizontally between said mould (14) and a position outside the press.

2. Press according to Claim 1, characterized in that said conveyor (26) is a slat conveyor and each slat (28)

carries said dish (29).

3. Press according to Claim 1, characterized in that said carriage (32) is placed above the conveyor (26).

4. Press according to Claim 1, characterized in that said pincer (35) comprises two arms (39, 40) pivoted mutually at (41), the arm (39) being stationary, whereas the arm (40) is rotatable about (41) against the bias of a spring (42), the rotation of the arm (40) being commanded by an actuating ram (45).

5. Press according to Claim 1, characterized in that the pincer (135) is integral with a pipe (51) carrying a suction apron (49) adapted to sweep the platen (10); said tube being mounted on a framing (53) so as to be reciprocable.

6. Press according to Claim 4, characterized in that said pincer (35) is surrounded by a sleeve (47) slidable axially relative thereto and terminated by a flange (48).

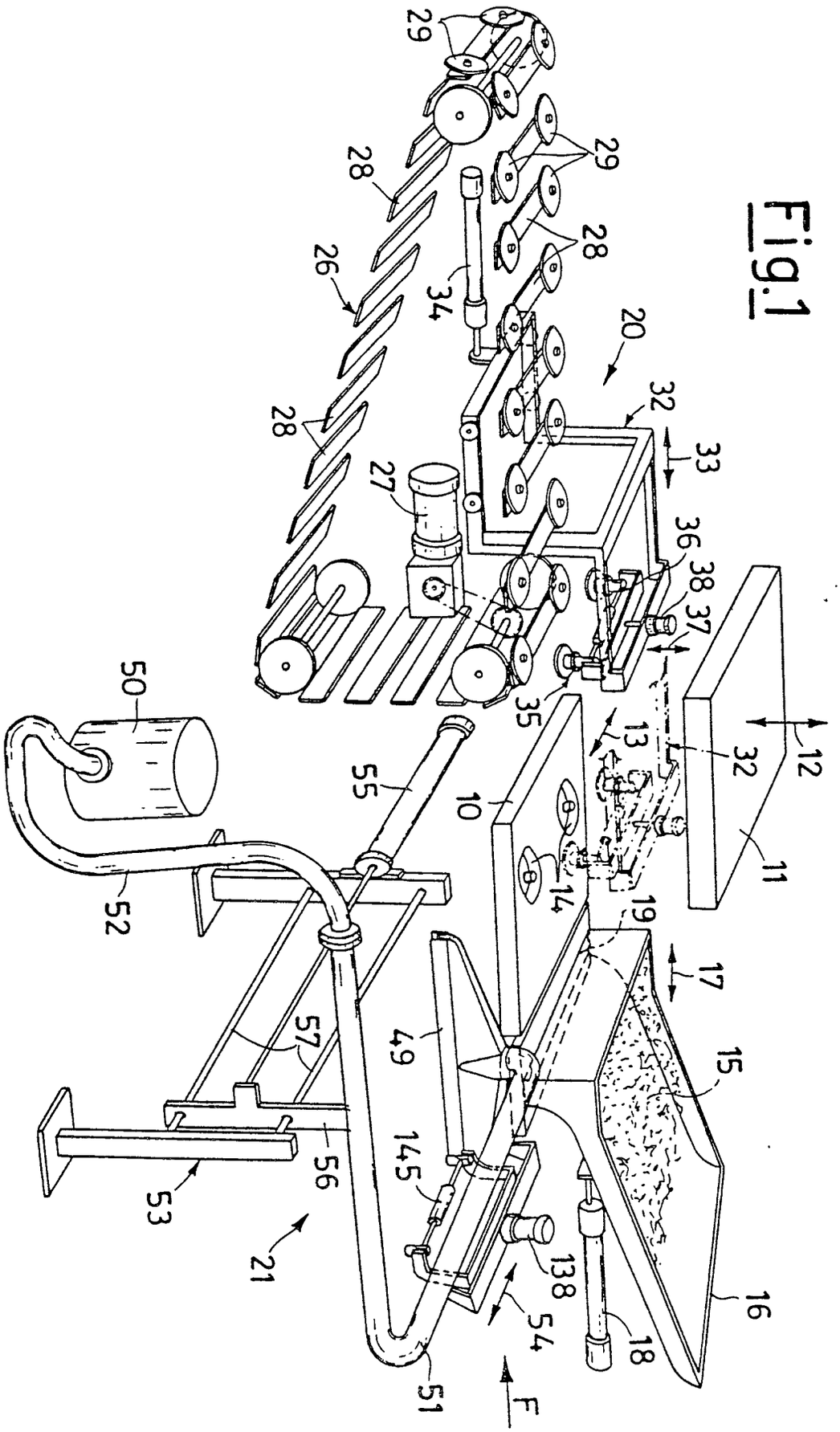
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Fig.1

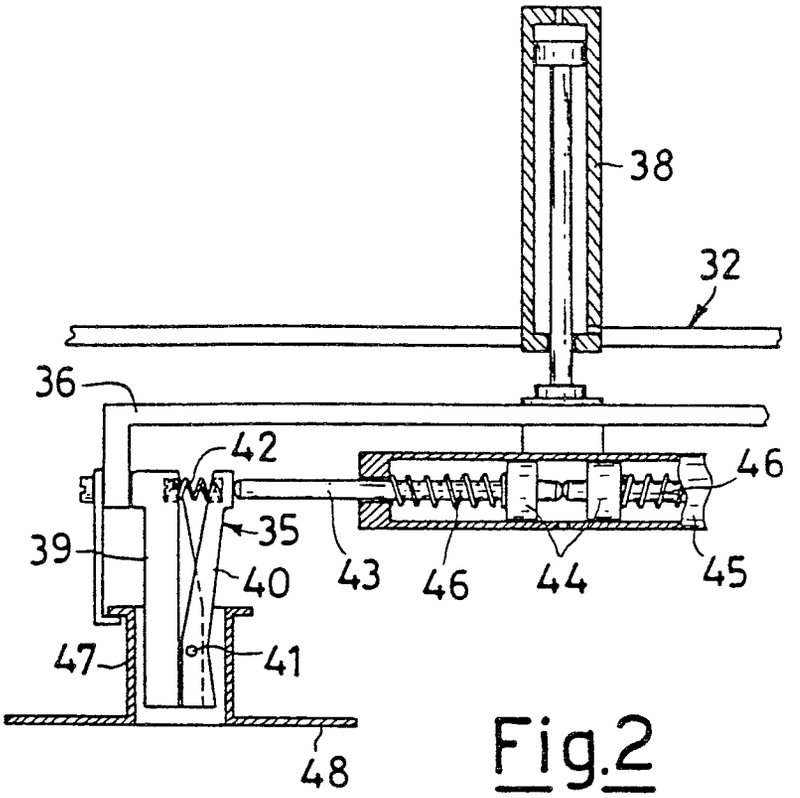
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Fig.2

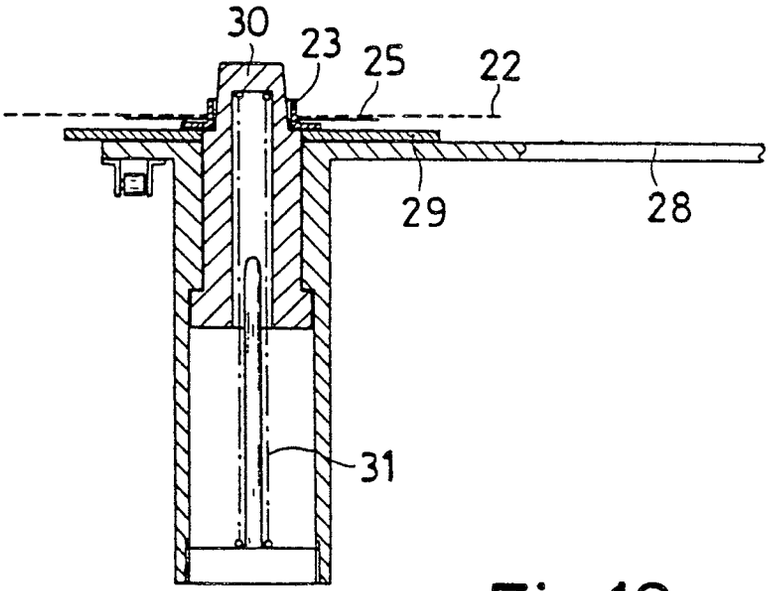
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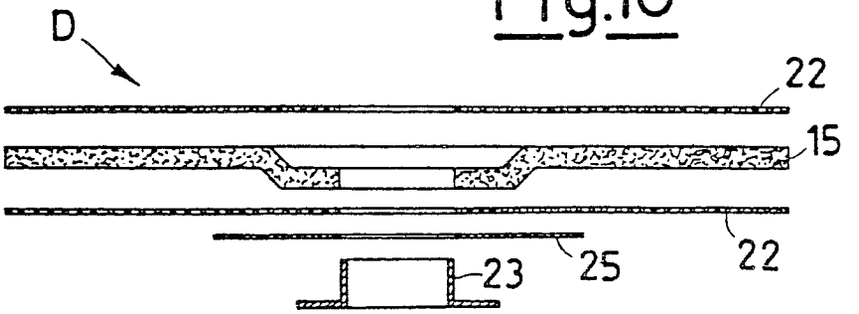
Fig.10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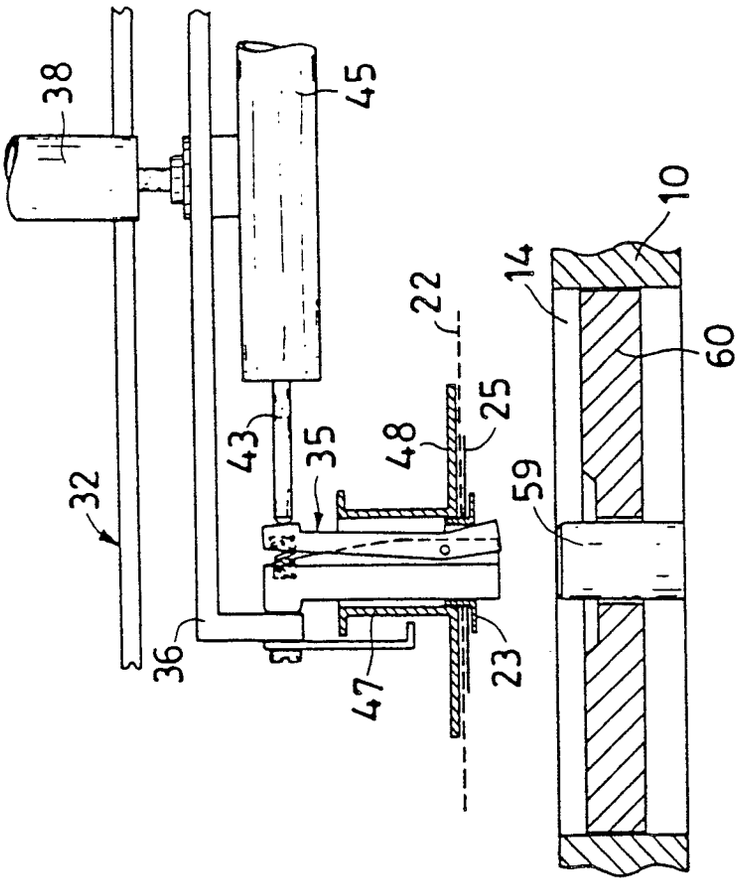
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Fig.4

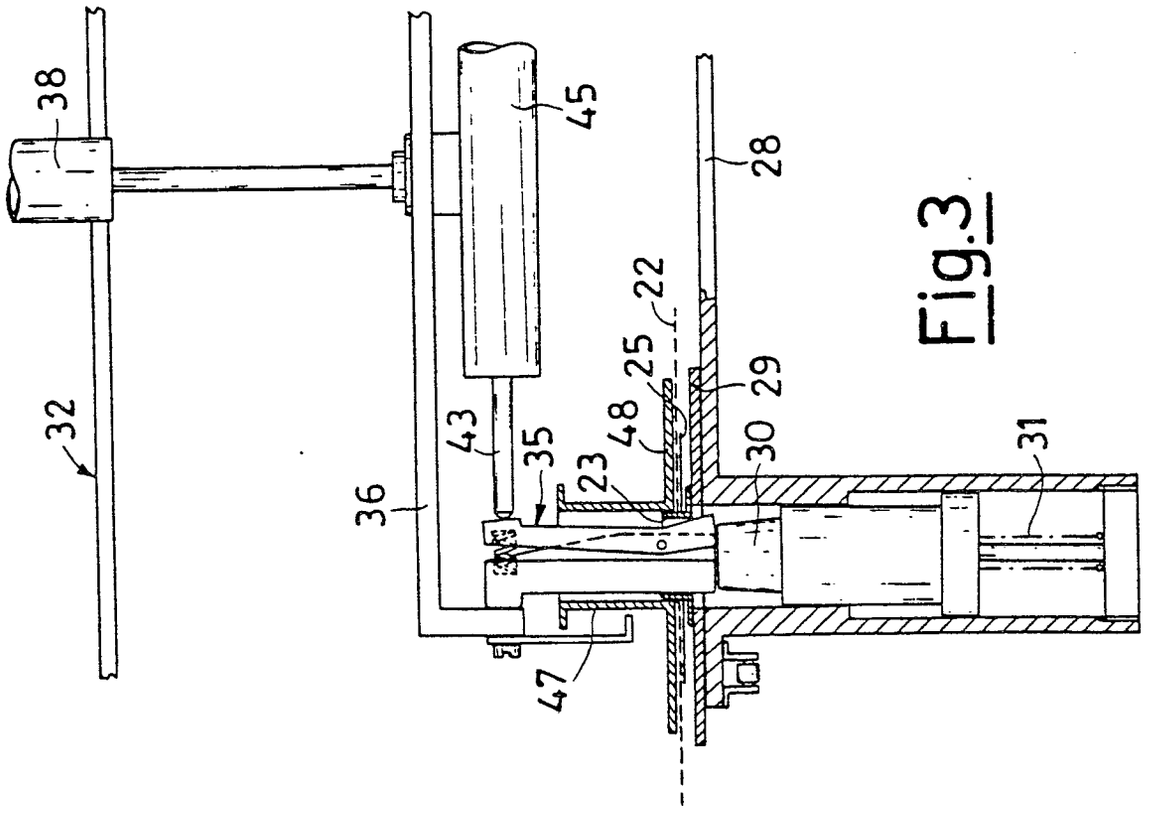
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Fig.3

Fig.6

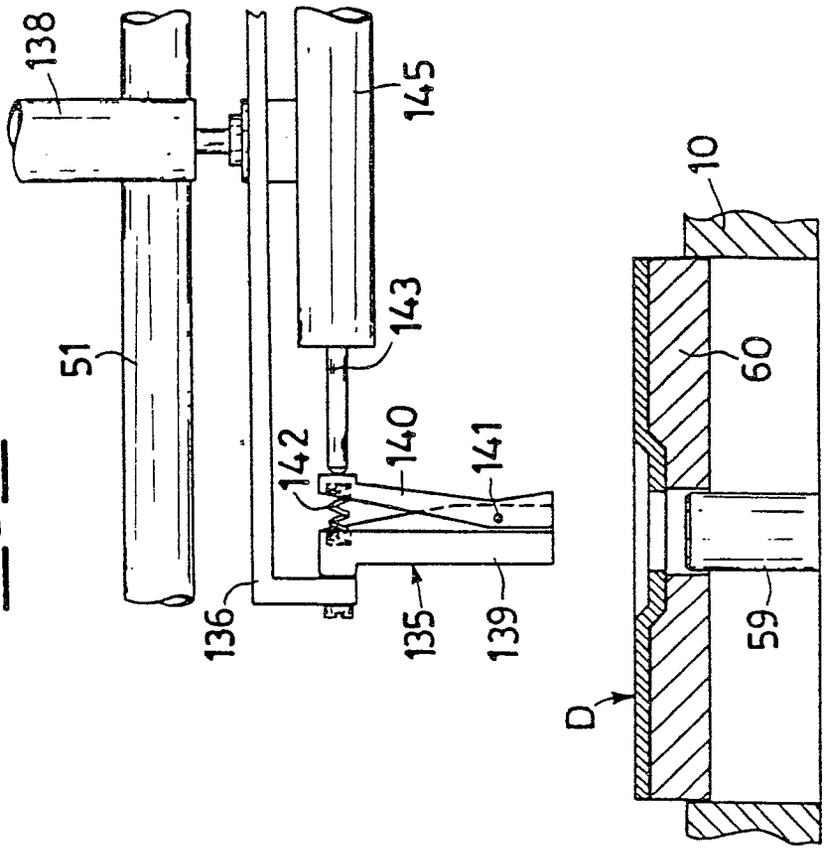
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Fig.5

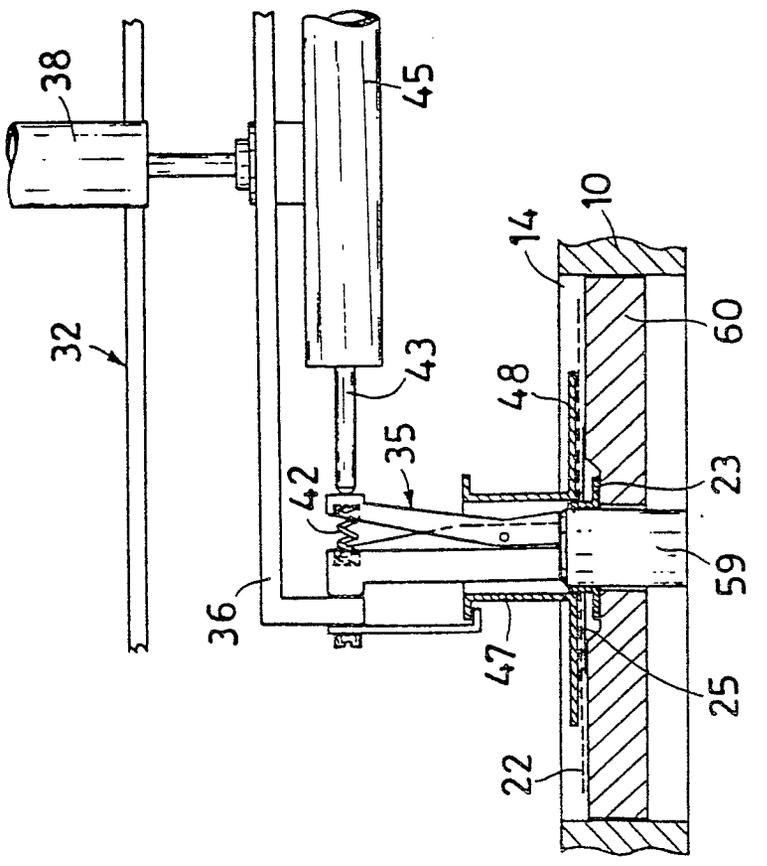
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Fig.8

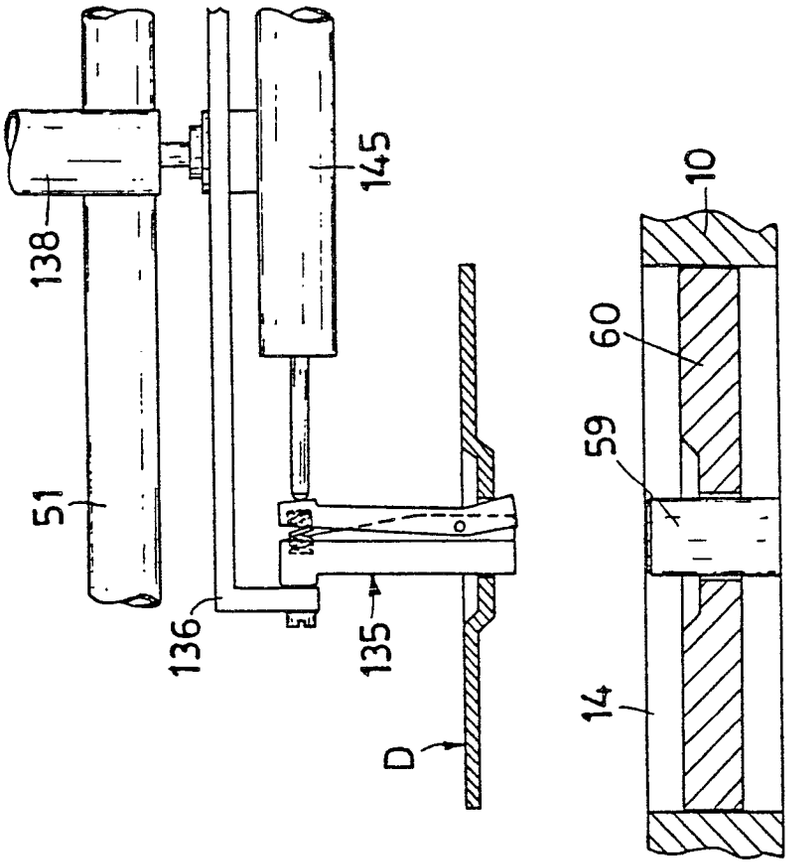


Fig.7

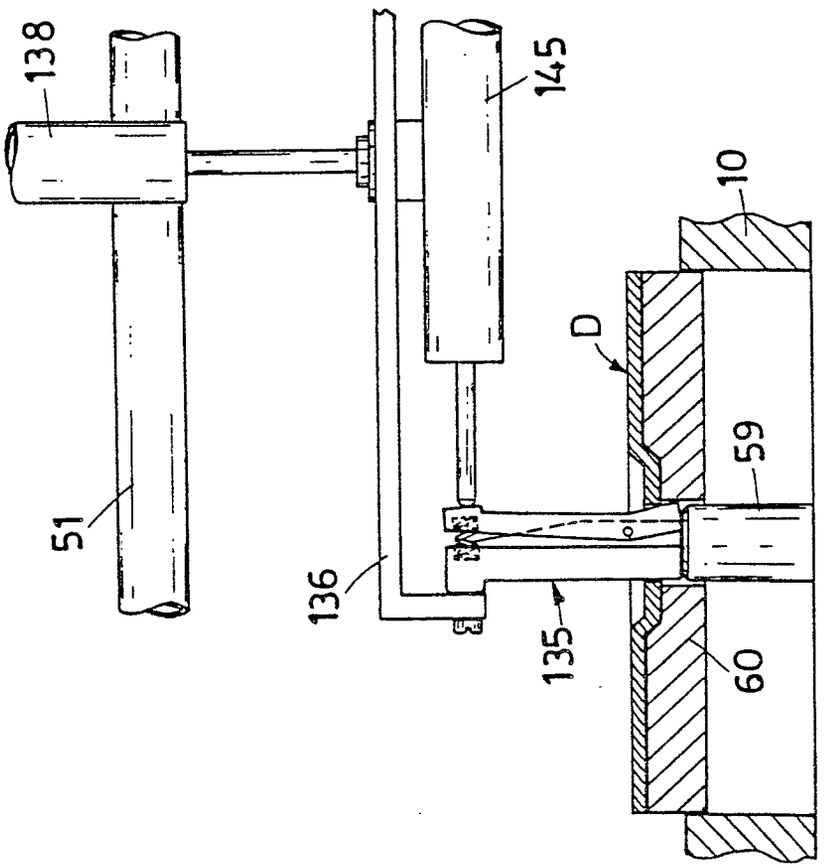
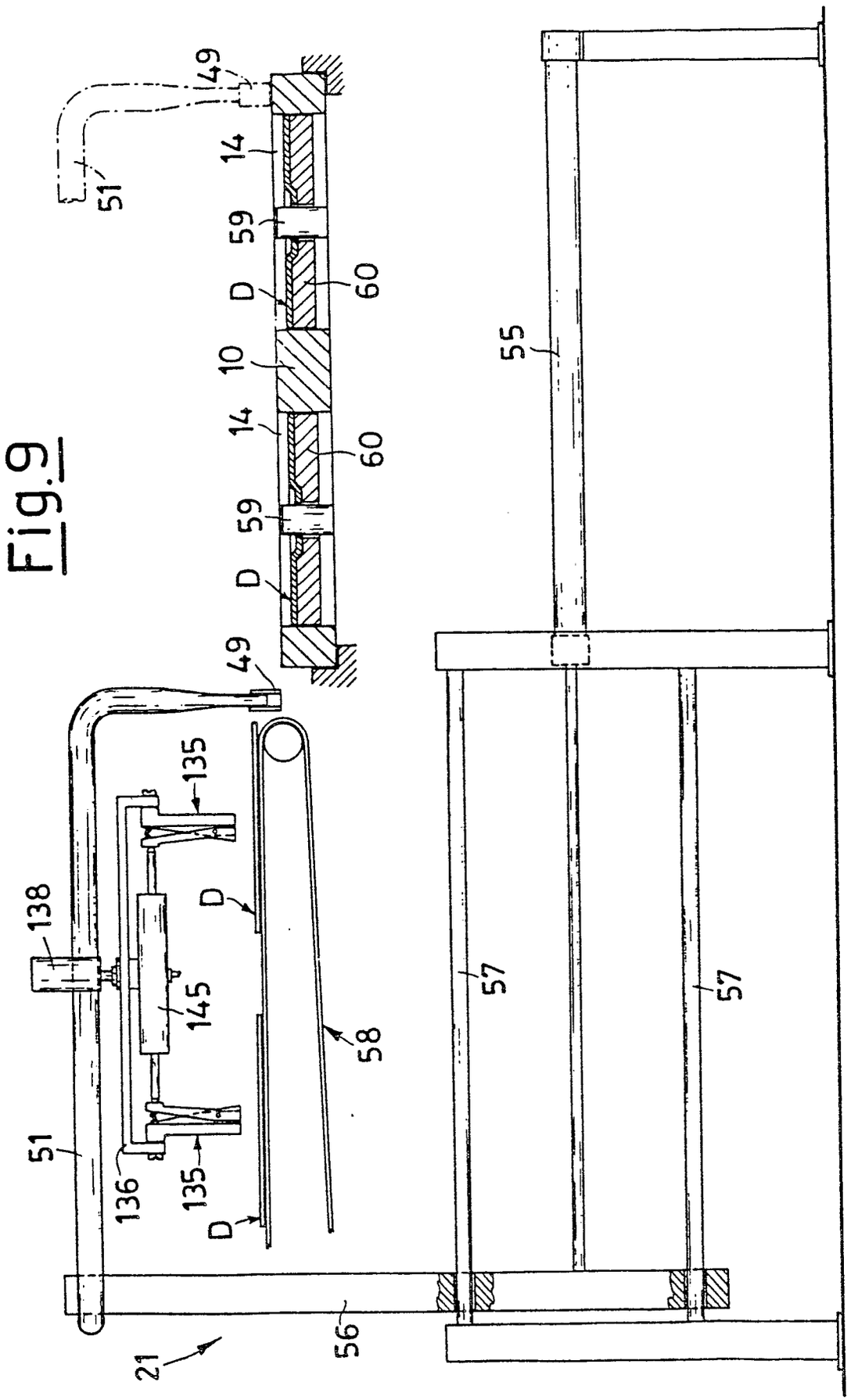


Fig.9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EUROPEAN SEARCH REPORT

Application number
EP 80 20 0983

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
A	FR - A - 1 556 866 (G. CARAMAGNA) * the whole document * --	1
A	US - A - 3 805 457 (YOZO SHIMIZU) * the whole document * --	1
A	FR - A - 1 252 515 (N.V. PHILIPS GLOEILAMPEN-FABRIEKEN) * the whole document * --	1
A	US - A - 3 722 710 (B.W. IXER) * the whole document * ------	4

CLASSIFICATION OF THE APPLICATION (Int. Cl.³)
B 24 D 7/00
B 30 B 15/30

TECHNICAL FIELDS SEARCHED (Int. Cl.³)
B 24 D
B 30 B
B 66 C

CATEGORY OF CITED DOCUMENTS
X: particularly relevant
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T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	26-01-1981	BOLLEN

EPO Form 1503.1 06.78