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(54) Flatwork ironer machine.

(57) A flatwork ironing machine (10) has an ironer section (12) and a flatwork feeding mechanism (14) adjacent to and integral with the ironer section, the feeding mechanism comprising a conveyor belt arrangement (22) with suction means (30, 34, 36) to retain flatwork on the belt arrangement and to "smooth out" flatwork prior to the flatwork contacting the belt arrangement.

The suction means (30) to retain flatwork on the belt arrangement is positioned inside the conveyor belt arrangement and includes a suction box member (30) with apertures (32) in the top surface through which air is sucked to retain flatwork on the belt arrangement which passes over said top surface of the box member.

The suction means to "smooth out" flatwork prior to the flatwork contacting the belt arrangement includes a suction chamber (34) positioned below the leading edge of the conveyor belt arrangement (22) and a guide roller (36) positioned adjacent the leading edge of the conveyor belt arrangement.

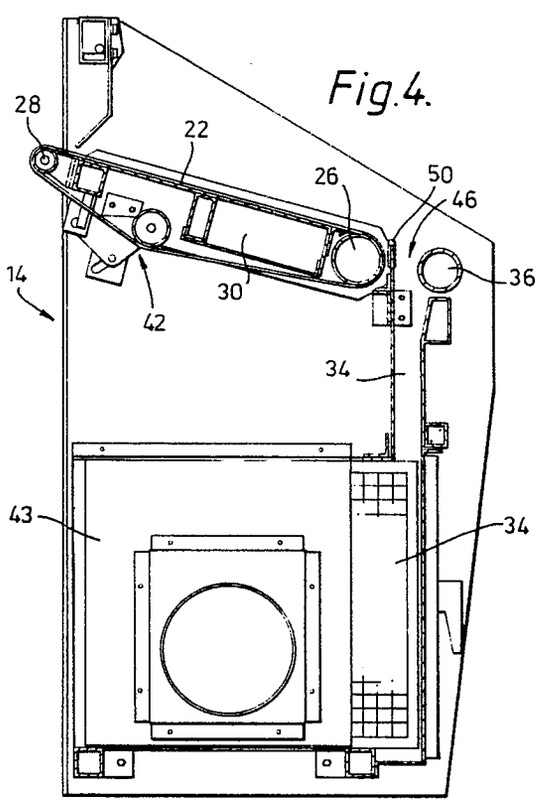

Fig.4.

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This invention relates to a flatwork ironing machine, and in particular to a commercial laundry flatwork ironing machine.

In known ironer machines, laundered flatwork (such as sheets) is usually laid by two operators onto an ordinary conveyor belt which feeds the flatwork to the ironing rolls. Such often produces ironed flatwork which is poorly finished (e.g. with wrinkles and creases).

In accordance with the present invention, a flatwork ironing machine has an ironer section and a flatwork feeding mechanism adjacent to and integral with the ironer section, the feeding mechanism comprising a conveyor belt arrangement with suction means to retain flatwork on the belt arrangement andor to "smooth out" flatwork prior to the flatwork contacting the belt arrangement.

Such a machine produces ironed flatwork which is well finished (i.e. without wrinkles and creases).

The suction means to retain flatwork on the belt arrangement is preferably positioned inside the conveyor belt arrangement, and includes a suction box member with apertures in the top surface through which air is sucked to retain flatwork on the belt arrangement which passes over said top surface of the box member.

The suction means to "smooth out" flatwork prior to the flatwork contacting the belt arrangement suitably includes a suction chamber positioned below the leading edge of the conveyor belt arrangement and a roller positioned adjacent the leading edge of the conveyor belt arrangement. The roller is rotated at a greater speed than the conveyor belt arrangement in order to guide the trailing portion of flatwork to the suction chamber.

The suction box member and suction chamber are advantageously interconnected whereby only one source of suction is required.

Alternatively, two independent sources of suction are provided for the suction box member and suction chamber.

Preferably, the conveyor belt arrangement comprises a plurality of separate belts supported side by side and having a common drive.

The ironer section includes at least one ironing roll, and advantageously a multi ironing roll arrangement.

The guide roller and conveyor belt arrangement are suitably independently driven, the conveyor belt arrangement being driven by the drive means of one of the ironing rolls.

The preferred ironing machine has the advantage that higher speeds of production can be obtained.

The invention will now be described by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of an ironer machine in accordance with the invention,

Figure 2 is a front view of the ironer machine of Figure 1,

Figure 3 is a side view of the flatwork feeding mechanism of the ironer machine of Figure 1,

Figure 4 is a cross-sectional side view of the flatwork feeding mechanism of the ironer machine of Figure 1, as taken along line X-X of Figure 2, and

Figure 5 is a plan view of the conveyor belt arrangement of the flatwork feeding mechanism of the ironer machine of Figure 1.

In Figure 1, a flatwork ironing machine 10 is shown having an ironer section 12 and a flatwork feeding mechanism 14 adjacent to and integrally housed with the ironer section 12, for feeding flatwork pieces to the ironer section.

The ironer section 12 has two ironing rolls 16 and 18 preferably driven at the same speed by a driving arrangement as disclosed in GB Patent No. 1590438 (the contents of which are incorporated by reference herewith). The ironer section 12 also has a plurality of tape tensioner mechanisms 20 spaced at frequent intervals across the width of the machine in order to maintain the flatwork pieces being ironed in contact with the ironing rolls 16 and 18. The tape tensioner mechanisms 20 are disclosed in detail in Japanese Patent Application No. 52-152498 (the contents of which are also incorporated by reference herewith).

The flatwork feeding mechanism 14 shown generally in Figure 1 and specifically in Figures 2 to 5, includes a conveyor belt arrangement 22 comprised of a plurality of separate belts 24 supported side by side about two common end rollers 26 and 28, and suction means.

The suction means consists firstly of a suction box member 30 to retain flatwork on the belt arrangement 22, the box member 30 being positioned inside the belt arrangement 22 and having a number of apertures 32 in the top surface thereof through which air is sucked thereby drawing and retaining the flatwork to the belt arrangement 22.

The suction means consists secondly of an upright suction chamber 34 and a guide roller 36 to "smooth out" flatwork prior to such contacting the belt arrangement, the suction chamber 34 being positioned below the leading edge of the belt arrangement 22, and the guide roller 36 being positioned adjacent the leading edge of the belt arrangement 22.

The end roller 26 of the belt arrangement 22 is driven by the drive means (not shown) of the first ironing roll 16 via chains and gears (also not shown) in order that flatwork is synchronizedly fed by the belts 24 to the roll 16, while the guide roller 36 is separately driven by a motor 38 at a greater

speed than the end roller 26. A belt tensioning mechanism 42 is provided to tension the belts 24 just sufficiently to allow drive to take place, since overtensioned belts 24 will fail prematurely.

A transfer chamber 43 is also provided connected both to the suction chamber 34 and the suction box 30 (via duct 44), the transfer chamber 43 having a fan (not shown) to cause suction in both the suction box 30 and suction chamber 34. The transfer chamber 43 is positioned below the belt arrangement 22 in order to utilize space and keep down the size of the machine 10.

In operation, the operator of the ironing machine 10 lays the leading portion of a flatwork piece onto the belts 24, and allows the remainder or trailing portion of the flatwork piece to become draped over the guide roller 36 and an opening 46 of the suction chamber 34. The leading portion of the flatwork piece is retained on the belts 24 due to the suction of the suction box member 30, while the whole of the remainder or trailing portion of the flatwork piece is drawn in the form of a U-loop into the suction chamber 34, by means of firstly the guide roller 36 rotating at a greater speed than the end roller 26 of the belt arrangement 22, and secondly the strong suction of the suction chamber 34. After the trailing edge of the flatwork piece has passed over the guide roller 36, the suction of the suction chamber 34 causes the now unlooped flatwork piece to flap and pull taut due to air currents, the resultant effect being that the trailing portion of the flatwork piece is smoothed out and straightened prior to contact with the belts 24 and the ironing rolls 16 and 18.

The machine 10 is provided with a smooth drag plate 50 just in front of the leading edge of the belt arrangement 22 in order to pull taut the flatwork piece just prior to contact thereof with the belts 24, thereby ensuring even tension across the full width of the flatwork piece.

The machine 10 is also provided with a see-through guard plate 48 on each side for safety purposes. In Figure 1 the left hand side guard plate 48 is shown removed for illustrations reasons. The guide roller 36 is, also for safety purposes, provided with a torque limiting device 40 which stops drive of the roller 36 in case an operator traps their fingers and/or hand on the guide roller.

The machine 10 has the advantage that production is substantially increased since an operator only has to place the flatwork piece on the belts 24 to be retained thereby, whereas in the past the operator had to monitor and guide the flatwork piece on the belts right up to the ironing section.

Claims

1. A flatwork ironing machine (10) has an ironer section (12) and a flatwork feeding mechanism (14) adjacent to and integral with the ironer section, the feeding mechanism comprising a conveyor belt arrangement (22) with suction means (30, 34, 36) to retain flatwork on the belt arrangement and/or to "smooth out" flatwork prior to the flatwork contacting the belt arrangement.

2. A machine as claimed in claim 1 wherein the suction means (30) to retain flatwork on the belt arrangement is positioned inside the conveyor belt arrangement (22).

3. A machine as claimed in either claim 1 or 2 wherein the suction means includes a suction box member (30) with apertures (32) in the top surface through which air is sucked to retain flatwork on the belt arrangement which passes over said top surface of the box member.

4. A machine as claimed in any preceding claim wherein the suction means to "smooth out" flatwork prior to the flatwork contacting the belt arrangement includes a suction chamber (34) positioned below the leading edge of the conveyor belt arrangement (22) and a guide roller (36) positioned adjacent the leading edge of the conveyor belt arrangement.

5. A machine as claimed in claim 4 as dependent on claim 3 wherein the suction box member (30) and suction chamber (34) are interconnected whereby only one source of suction is required.

6. A machine as claimed in claim 4 as dependent on claim 3 wherein two independent sources of suction are provided for the suction box member (30) and suction chamber (34).

7. A machine as claimed in any one of claims 4 to 6 wherein the guide roller (36) is rotated at a greater speed than the conveyor belt arrangement (22) in order to guide the trailing portion of flatwork to the suction chamber (34).

8. A machine as claimed in any one of claims 4 to 7 wherein the guide roller (36) and conveyor belt arrangement (22) are independently driven.

9. A machine as claimed in any preceding claim wherein the conveyor belt arrangement comprises a plurality of separate belts (24) supported side by side and having a common drive.

10. A machine as claimed in any preceding claim wherein the conveyor belt arrangement (22) is driven by the drive means of the ironing section (12).

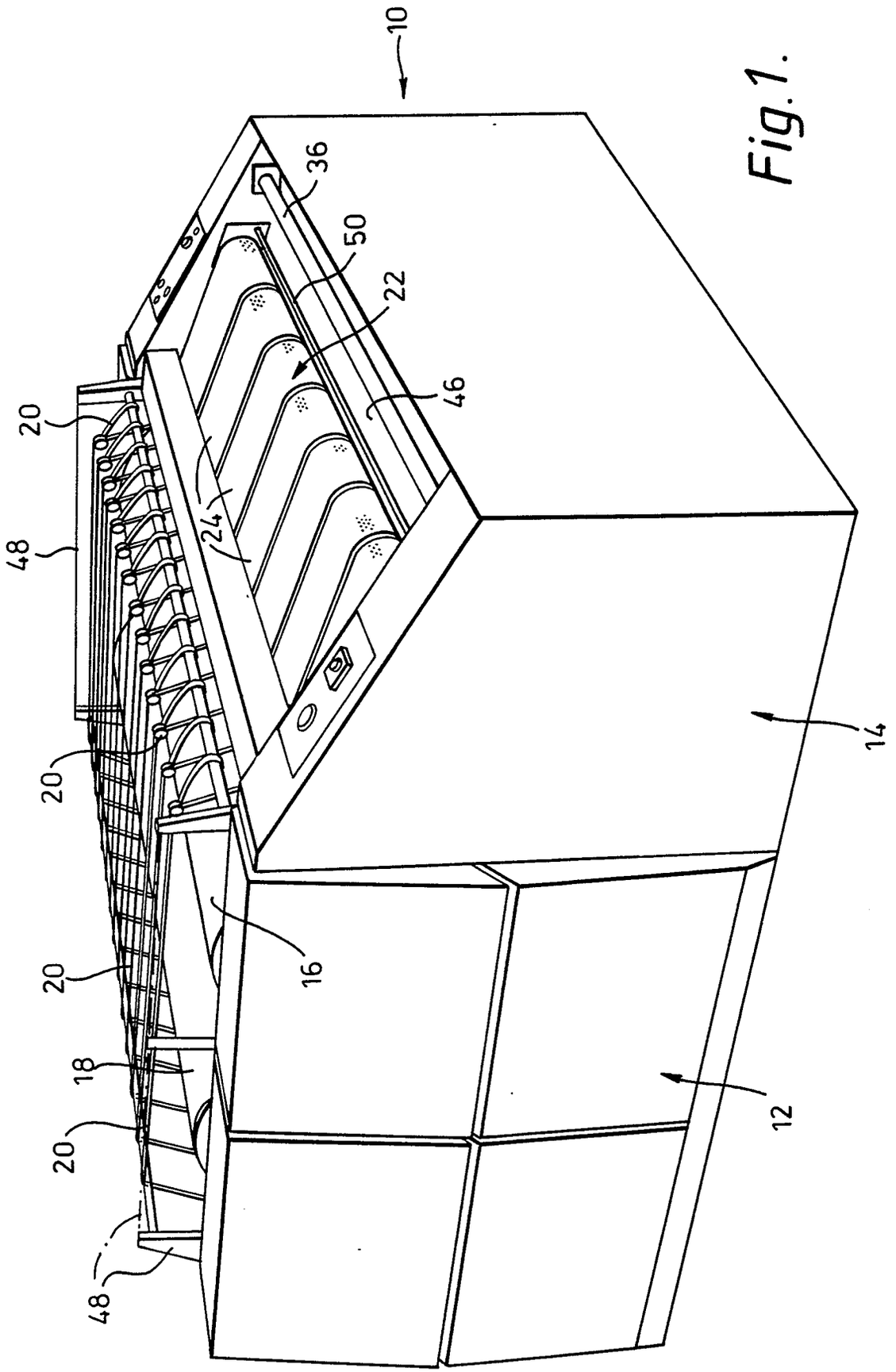


Fig.1.

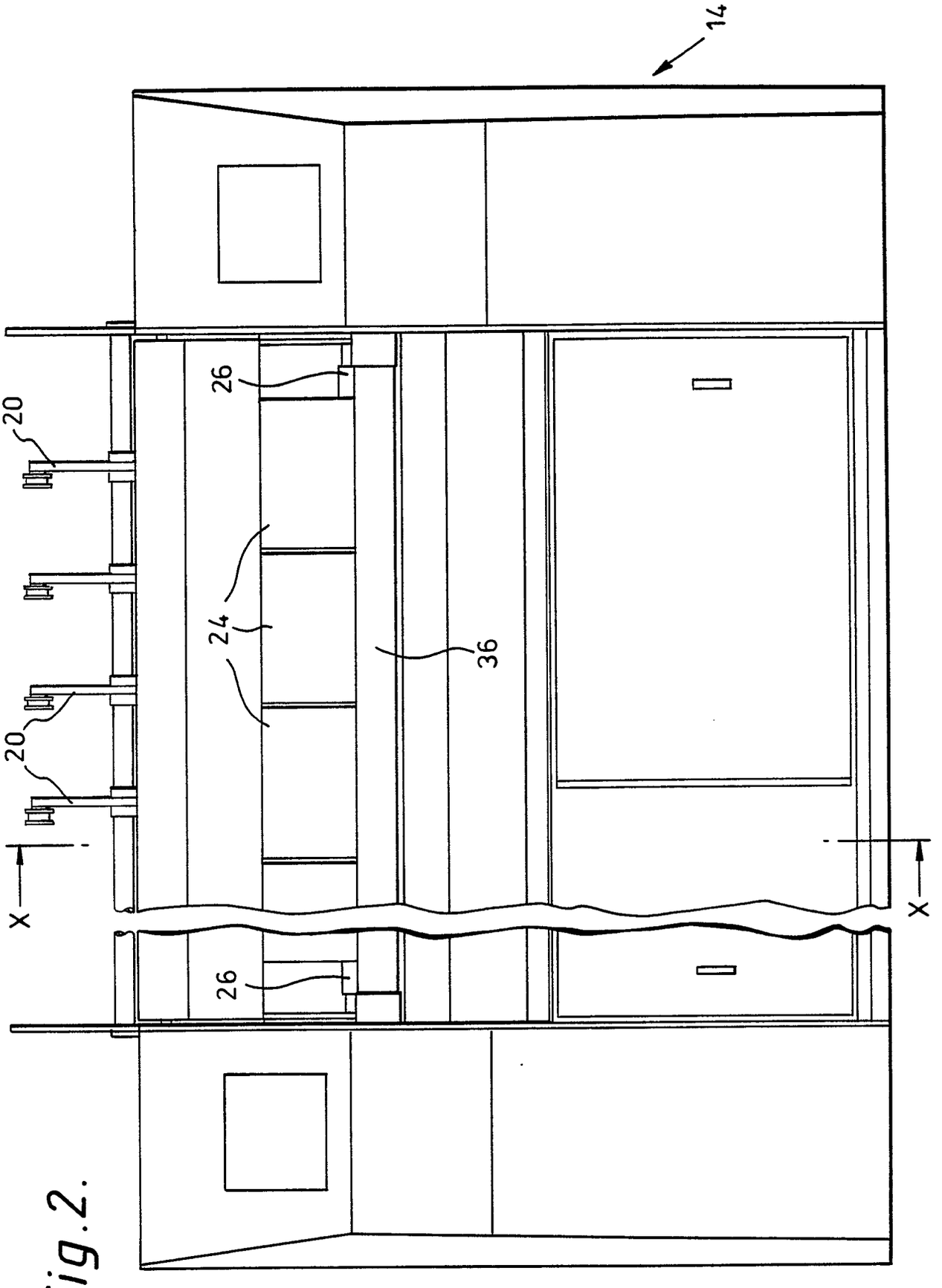


Fig.2.

Fig.4.

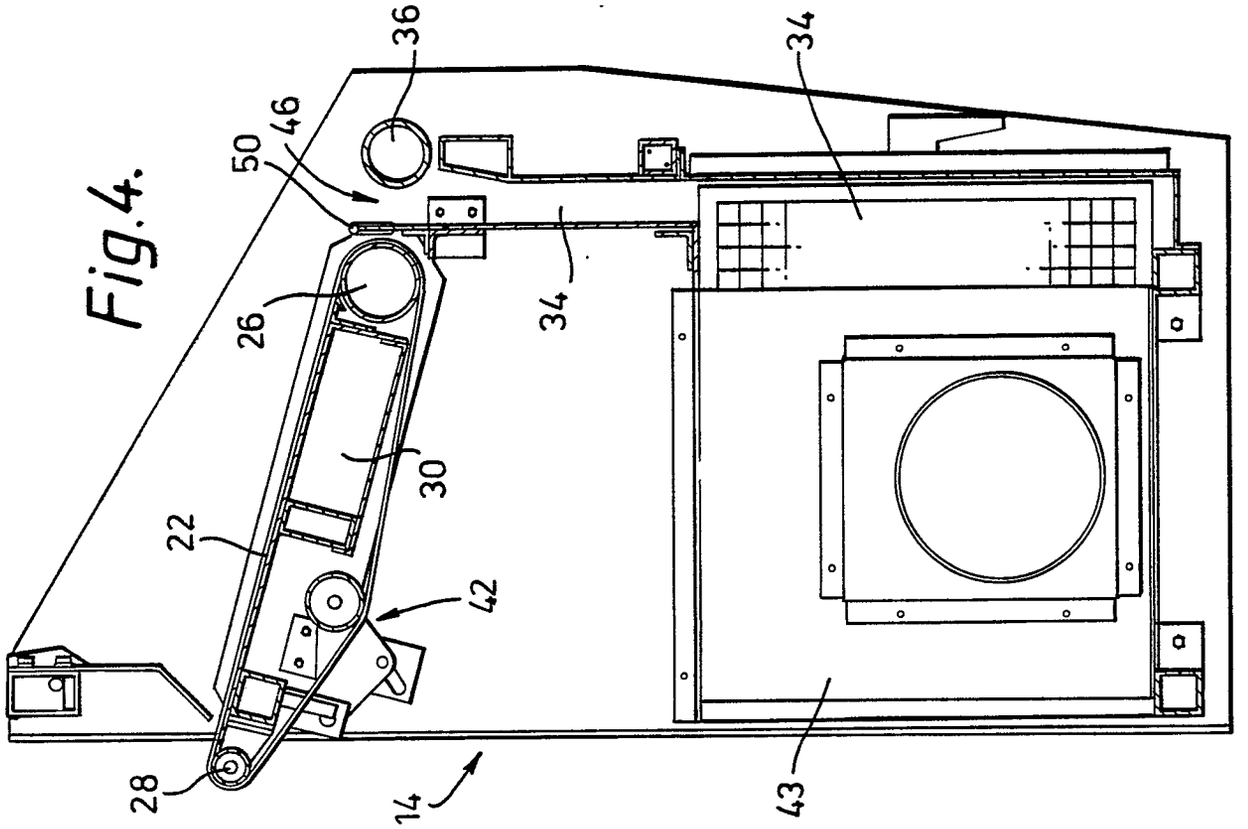
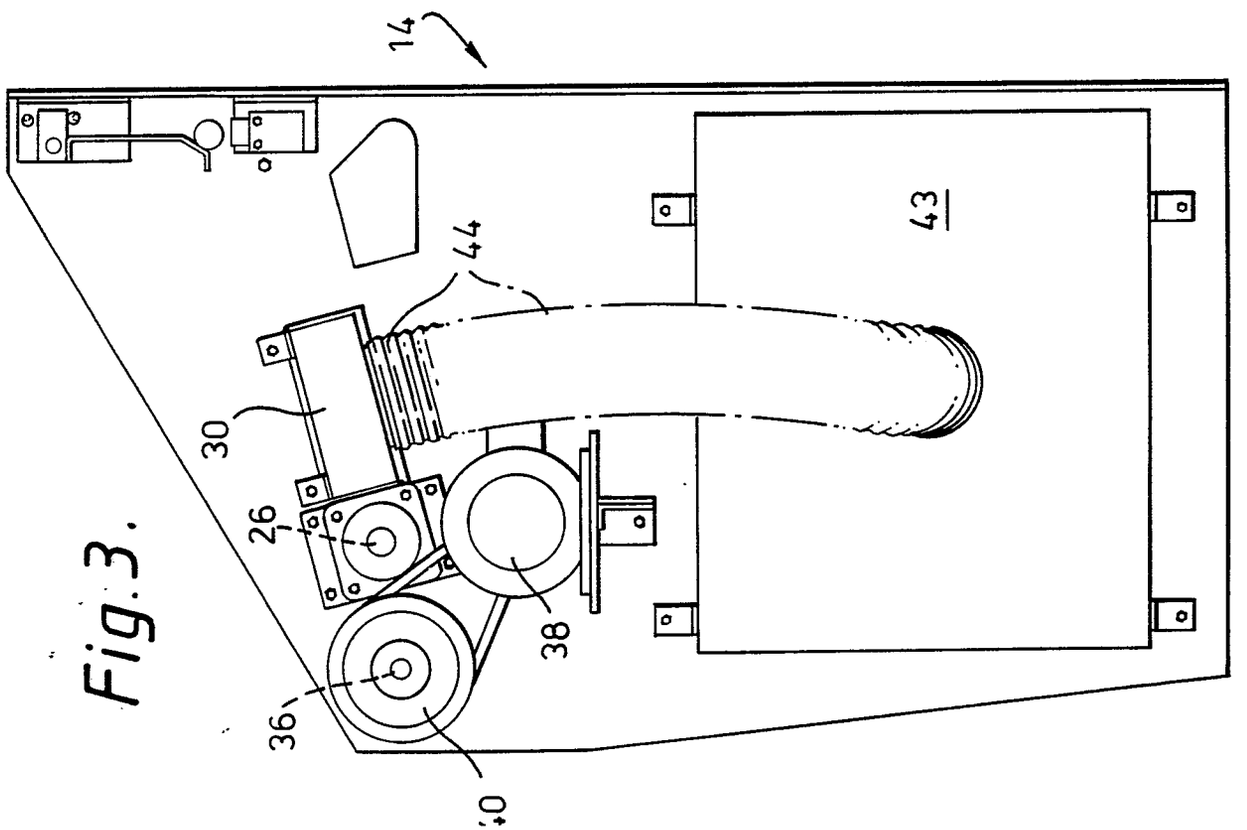


Fig.3.



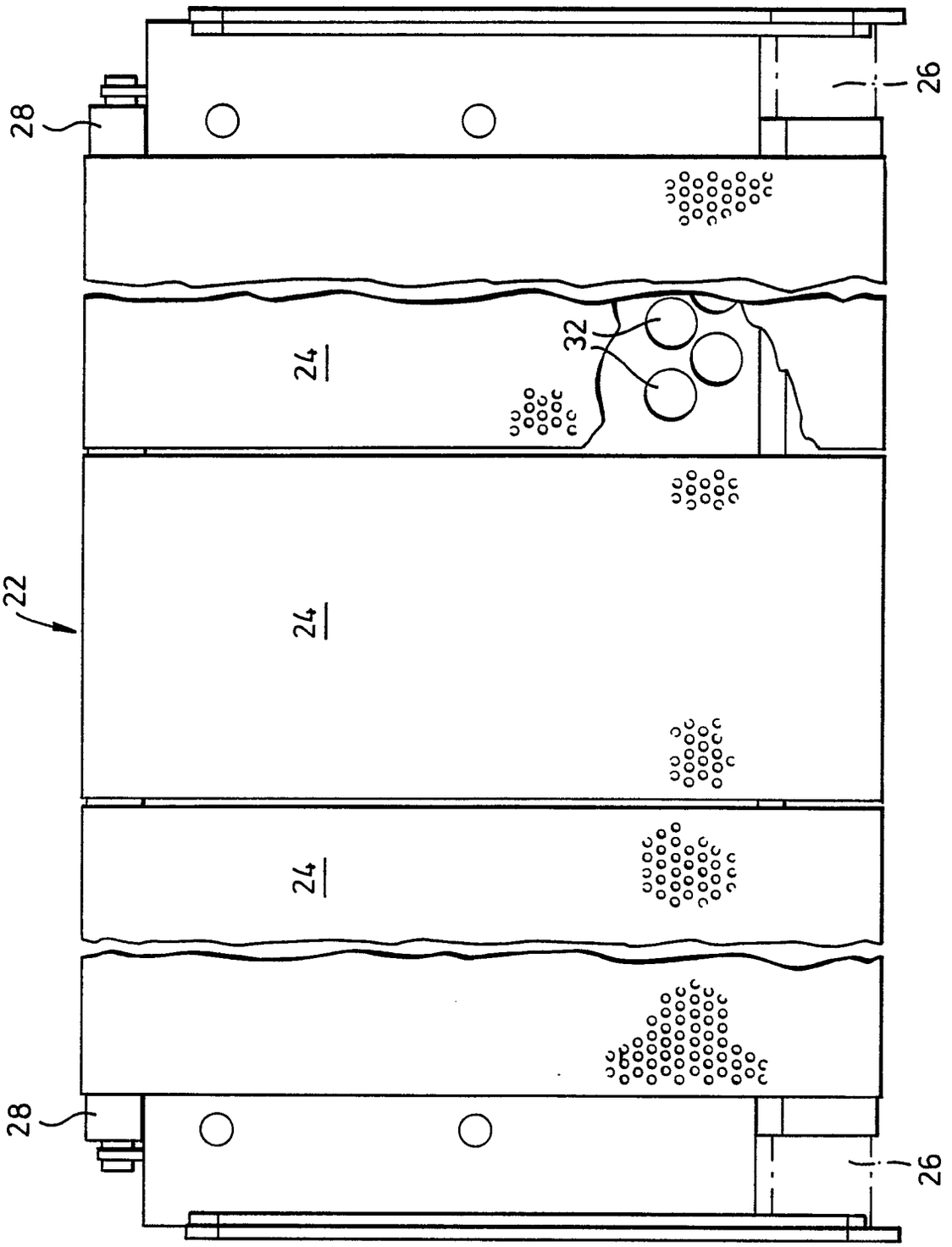


Fig. 5.

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EUROPEAN SEARCH REPORT

Application number

EP 87 30 2495

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	EP-A-0 093 365 (O.M.P.) * Page 2, lines 24-26; page 3, lines 22-28; page 5, line 31 - page 6, line 5; page 8, lines 10-21; claim 13; figures 1,2,4 *	1-3,9, 10	D 06 F 67/04
Y		5-8	
X	US-A-3 735 512 (ROSS) * Column 3, lines 13-26; claim 5; figures 1-3 *	1-3	
X	DE-A-2 756 123 (KANNEGIESSER) * Page 9, paragraphs 1-3; page 10, first paragraph - page 13, last paragraph; figures 1,3,4 *	1,4	
X	FR-A-2 170 268 (BAZELMANS) * Page 3, line 40; page 4, lines 1-8,15-18; page 5, line 8 - page 7, line 13; figures 1,3-7 *	1,4	TECHNICAL FIELDS SEARCHED (Int. Cl.4) D 06 F
Y		5-8	
A	FR-A-1 453 539 (KLEINDIENST)		
A	GB-A-1 105 342 (GREGORY)		

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	10-07-1987	BOURSEAU A.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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