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

(11) Publication number: **0 331 661**
A1

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **89850076.4**

(22) Date of filing: **03.03.89**

(51) Int. Cl.4: **B 21 D 43/04**
B 30 B 15/30

(30) Priority: **04.03.88 FI 881027**

(43) Date of publication of application:
06.09.89 Bulletin 89/36

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

(71) Applicant: **RAUMA-REPOLA OY**
Loviisan Tehtaat
SF-07910 Valko (FI)

(72) Inventor: **Laine, Markku**
Braskintie 4 B
SF-07910 Valko (FI)

(74) Representative: **Mrazek, Werner et al**
Dr. Ludwig Brann Patentbyra AB Drottninggatan 7 Box 1344
S-751 43 Uppsala (SE)

(54) **Sheet press.**

(57) A sheet press, particularly for coating sheets, comprising heating plates (1, 2) between which a sheet (3) is pressed; a feeder (4) with which the sheet entering the press can be placed between the heating plates (1, 2) of the press; and an unloader (5) such as a suction cup unloader, capable of removing the ready-pressed sheets from between the heating plates of the press. The feeder (4) comprises a clamping device, mounted to the side of the unloader (5) and capable of pulling the sheet into the press between the heating plates (1, 2) of the press simultaneously as the unloader (5) removes the pressed sheet (3) from between the heating plates (1, 2) of the press.

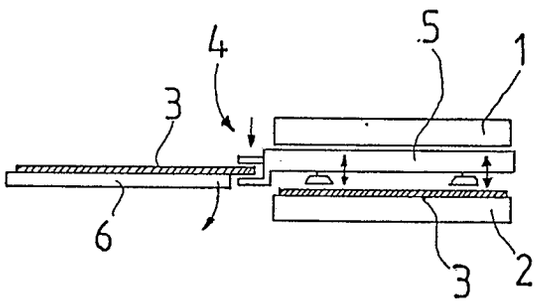

Fig.1

EP 0 331 661 A1

Description

SHEET PRESS

The present invention concerns a sheet press, particularly used for coating sheets, comprising heating plates between which the sheet to be processed is pressed; a sheet feeder with which the sheet to be introduced into the press can be placed between the heating plates of the press; and a conveyor such as a suction cup conveyor, with which the pressed sheets can be removed from between the heating plates of the press.

Prior art sheet presses have the sheet feeders and sheet unloaders as separate structures of the press equipment.

The aim of the present invention is to provide a new kind of a sheet press with a simplified construction compared with prior art sheet presses. The sheet press in accordance with the invention is characterized by having a feeder comprised of a clamping device, which is mounted to the side of the unloader and is capable of clamping to the edge of the entering sheet and pulling it into the press between the heating plates of the press while simultaneously the unloader removes a ready-pressed sheet from between the heating plates of the press. The invention provides a simple feeder/unloader combination, which in one simultaneous operation both feeds sheets into the press and unloads pressed sheets. The press has a simplified construction compared with prior art presses, which hence provides a cost advantage.

An advantageous embodiment of the invention is characterized by having the clamping device comprising jaws, which are closed by compression to the edge of the sheet. The jaws with a simple construction are easy to control, and their clamping force is sufficient for pulling the sheet into the press.

Another embodiment of the invention is characterized by having a tiltable construction of the conveyor table in front of the press, with the table edge provided with a ramp ending at the lower heating plate of the press so that the rear edge of the sheet entering the press can sweep along the ramp from the conveyor table onto the heating plate. The rear edge of the entering sheet can sweep over the conveyor table and the ramp all the way down to the lower heating plate of the press, onto which the sheet is dropped in order to start the pressing phase.

A third embodiment of the invention is characterized by having the conveyor table adapted in front of the sheet press and adapted movable along with the feed movement into the press, thus providing support to the sheet to be pressed, and being withdrawable from the press prior to the pressing of the sheet.

A further embodiment of the invention is characterized by having the feed movement of the conveyor table, the opening movement of the jaws and the return movement of the conveyor table adjustable so that the sheet is dropped to a desired position onto the heating plate. This provides a direct entrance of the sheet into the press, thus avoiding dragging one edge of the sheet.

In the following, the invention will be examined in more detail by means of the exemplifying embodiment with reference to the attached drawings, in which

Figs. 1...4 show the operation of the press.

Fig. 2 shows a press according to another embodiment of the invention.

The sheet press comprises heating plates 1, 2 between which a sheet 3 will be pressed. The press incorporates a feeder 4 of the sheets 3, with which the sheet entering the press can be placed between the heating plates of the press. Further, the press incorporates an unloader 5 with suction cups, capable of removing the pressed sheets 3 from between the heating plates 1, 2 of the press. The feeder 4 comprises a clamping device, mounted to the side of the unloader 5 and capable of pulling the sheet 3 into the press between the heating plates 1, 2 of the press simultaneously as the unloader 5 removes the ready-pressed sheet 3 from between the heating plates 1, 2 of the press. The clamping device 4 comprises jaws, which are closed by compression to the edge of the sheet 3. A conveyor table 6 in front of the press is tiltable having the table edge provided with a ramp 7 ending at the lower heating plate 2 of the press, along which ramp the rear edge of the sheet 3 entering the press can sweep from the conveyor table 6 onto the heating plate 2.

According to Fig. 5 the conveyor table in front of the sheet press is movable along with the feed movement into the press, thus providing support to the sheet to be pressed, and is withdrawable from the press prior to the pressing of the sheet. The feed movement of the conveyor table, the opening movement of the jaws, and the return movement of the conveyor table are adjustable so that the sheet is dropped to a desired position onto the heating plate.

The operation of the press is as follows:

According to Fig. 1, the press is opened, whereby the combined feeder/unloader 4, 5 enters the press until the jaws of the feeder 4 are aligned with the edge of the entering sheet.

According to Fig. 2, the feeder 4 clamps to the sheet simultaneously as the suction cups of the unloader 5 pick up the ready-pressed sheet and lift it off from the lower heating plate 2. Coincidingly, the conveyor table 6 tilts toward the press and the ramp of the front edge of the conveyor table 6 is pushed over the front edge of the lower heating plate 2 of the press.

According to Fig. 3, the feeder/unloader mechanism 4, 5 is withdrawn from the press. The mechanism will, however, be stopped as soon as the new sheet has arrived to a correct position within the press. The feeder 4 now drops the front edge of the new sheet 3 down onto the heating plate. The mechanism continues the withdrawal movement from the press and stops at its limit position.

According to Fig. 4, the press is allowed to be

closed while the feeder/unloader mechanism 4, 5 continues its withdrawal after dropping the new sheet. When the mechanism reaches its limit position, the suction cups release the withdrawn sheet onto a roller conveyor for transfer.

According to Fig. 5, in this embodiment of the invention, the sheet 3 enters the press pulled by the clamping device 4 and supported by the conveyor table 6. The rest of the functions are similar to those illustrated in Figs. 1...4.

Claims

1. A sheet press, particularly used for coating sheets, comprising heating plates (1, 2) between which a sheet (3) is pressed; a feeder (4) with which the sheet entering the press can be placed between the heating plates (1, 2) of the press; and an unloader (5) such as a suction cup conveyor, capable of removing the pressed sheets from between the heating plates of the press, **characterized** in that the feeder (4) comprises a clamping device (4), mounted to the side of the unloader (5) and capable of pulling the sheet (3) into the press between the heating plates (1, 2) of the press simultaneously as the unloader (5) removes the ready-pressed sheet (3) from between the heating plates (1, 2) of the press.

2. A sheet press as claimed in claim 1, **characterized** in that the clamping device (4) comprises jaws, which are closed by compression to the edge of the sheet (3).

3. A sheet press as claimed in claim 1 or 2, **characterized** in that a conveyor table (6) in front of the press is adapted tiltable having the table edge provided with a ramp (7) ending at the lower heating plate (2) of the press, along which ramp the rear edge of the sheet entering the press can sweep from the conveyor table (6) onto the heating plate (2).

4. A sheet press as claimed in claim 1 or 2, **characterized** in that the conveyor table (6) in front of the press is adapted movable along with the feed movement into the press, thus providing support to the sheet (3) to be pressed, and is adapted withdrawable from the press prior to the pressing of the sheet (3).

5. A sheet press as claimed in claim 4, **characterized** in that the feed movement of the conveyor table (6), the opening movement of the jaws (4), and the return movement of the conveyor table are adjustable so that the sheet (3) is dropped to a desired position onto the heating plate (2).

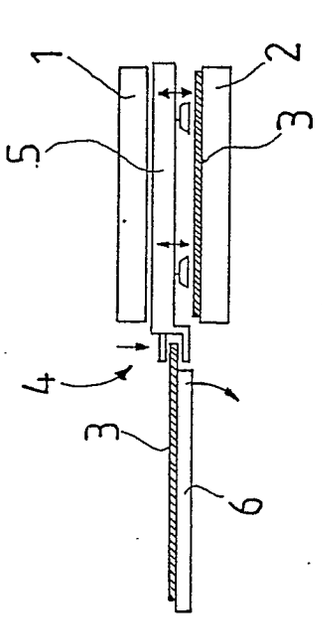

Fig.1

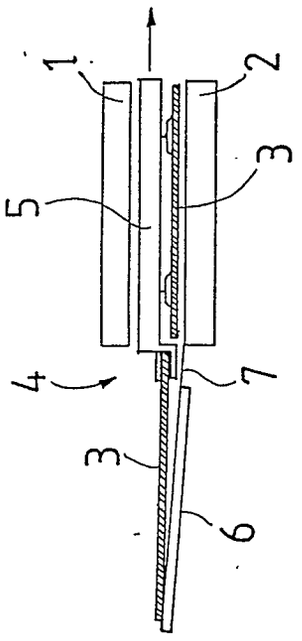

Fig.2

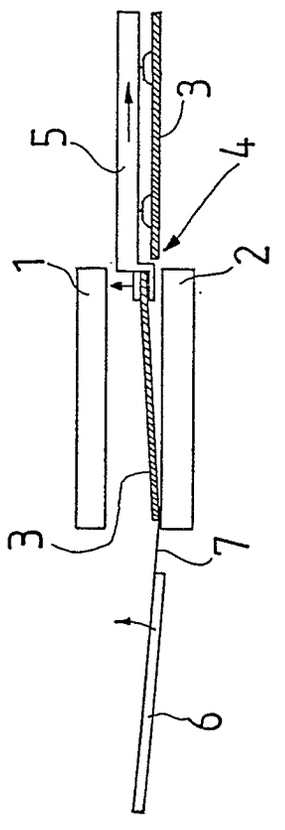

Fig.3

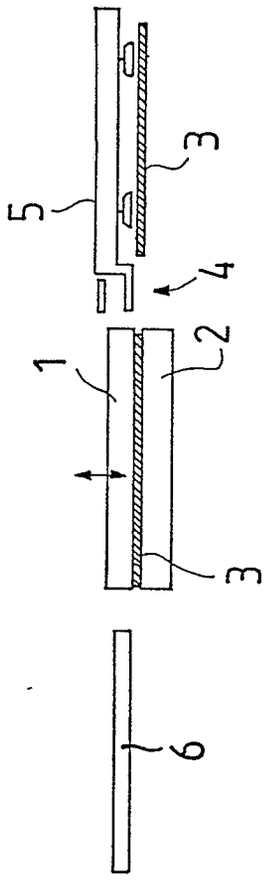

Fig.4

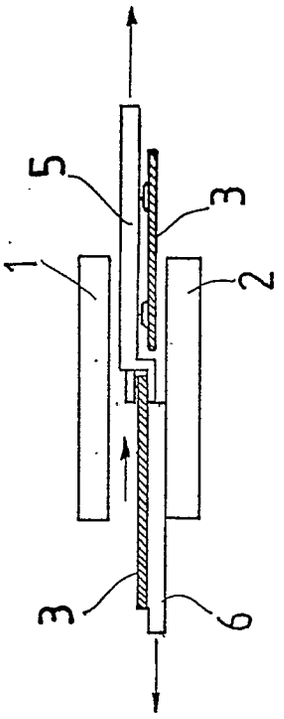

Fig.5

European Patent Office

EUROPEAN SEARCH REPORT

Application number

DOCUMENTS CONSIDERED TO BE RELEVANT

EP 89850076.4

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	US - A - 4 348 252 (KNOOP) * Column 2, lines 18-23 * --	1	B 21 D 43/04 B 30 B 15/30
A	GB - A - 1 604 291 (WEINGARTEN) * Page 1, lines 50,51,56,57; page 2, lines 59,60 * ----	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

B 21 D 43/00
B 30 B 15/00

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	05-06-1989	DRNOWITZ

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO Form 1503 03 82