

[54] CONTINUOUSLY OPERATING PRESS
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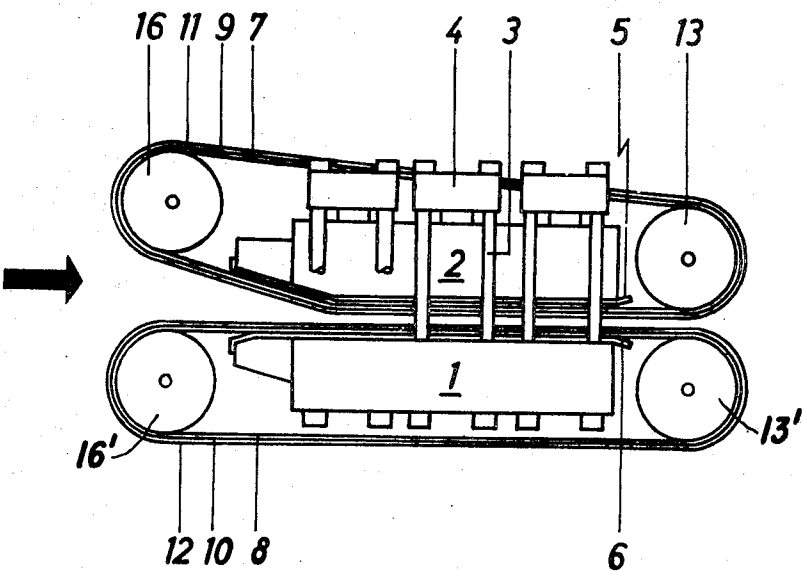
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[51] Int. Cl.B30b 5/04, B30b 15/00, B67b 3/26
[58] Field of Search.....100/151, 152, 153, 154, 118, 100/121, 99, 53; 144/281 B

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[57] ABSTRACT
A first plurality of endless steel belts is interposed between a plunger and a table and abuts against the plunger. A second plurality of endless steel belts is interposed between the plunger and the table and abuts against the table. Different combinations of drive rollers and deflection rollers are utilized to move the steel belts around the plunger and around the table.

9 Claims, 4 Drawing Figures



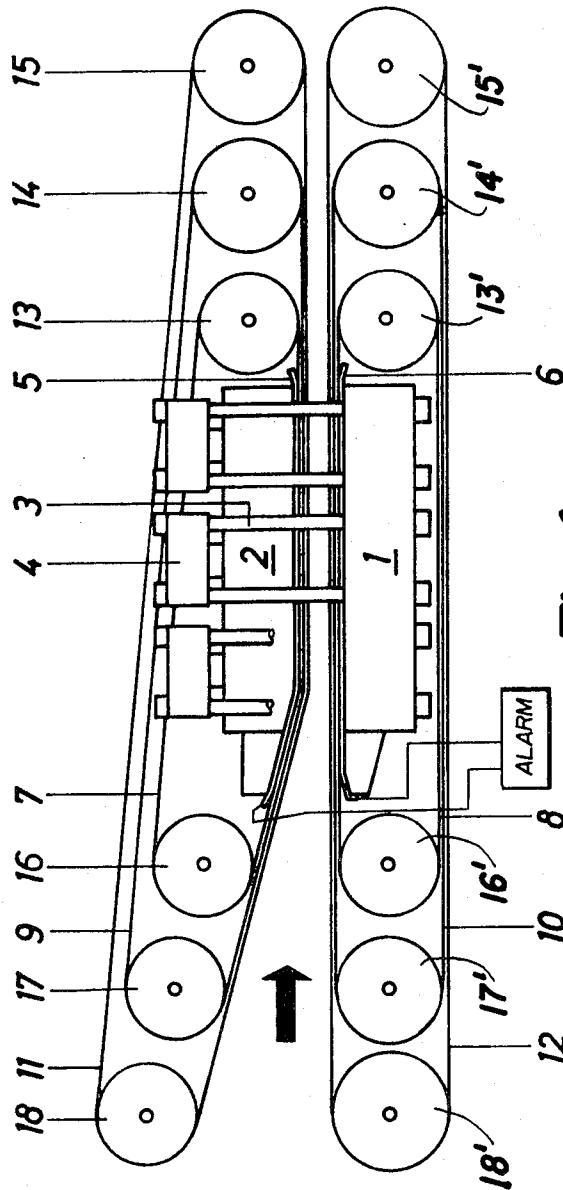
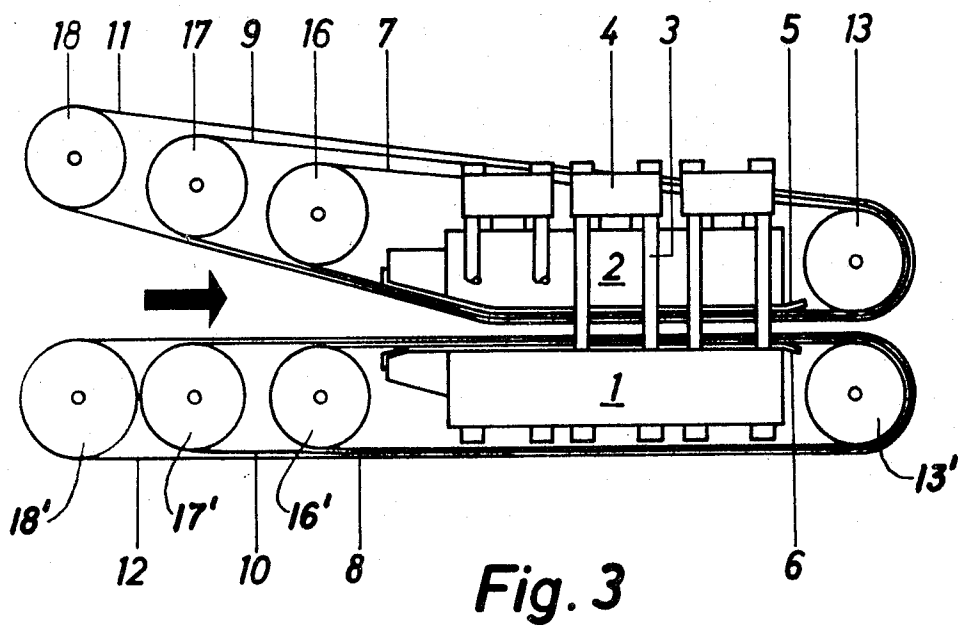
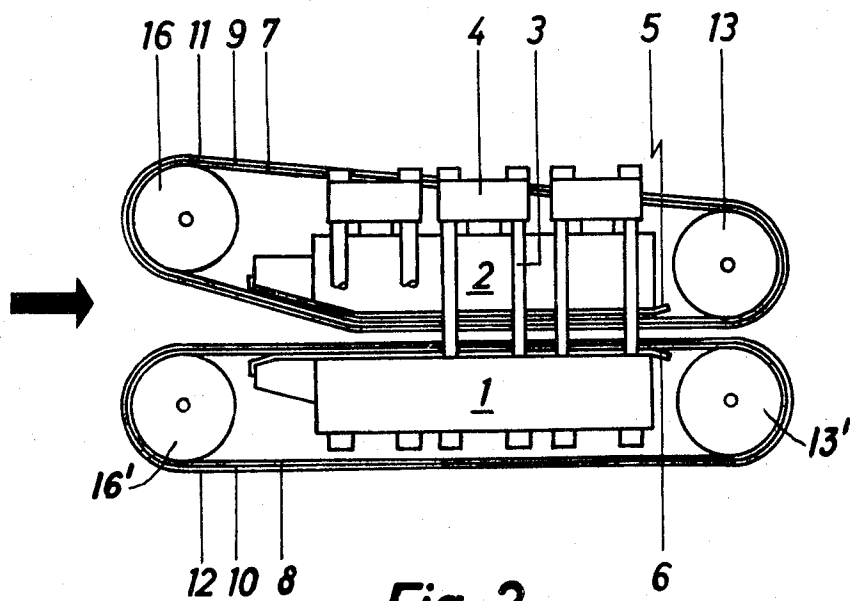


Fig. 1



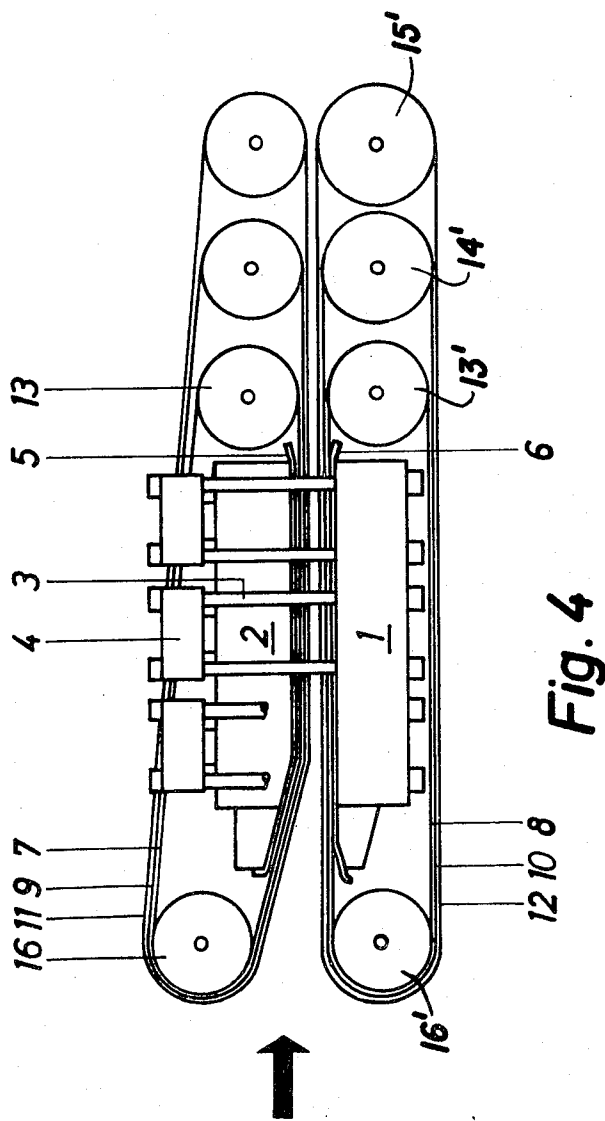


Fig. 4

CONTINUOUSLY OPERATING PRESS

DESCRIPTION OF THE INVENTION

The invention relates to a continuously operating press. More particularly, the invention relates to a continuously operating press for producing wood composition boards, fiber panels, plywood and the like.

The continuously operating press of the invention utilizes two flexible endless belts which transmit pressure and move material to be pressed through the press. The flexible endless belts are preferably steel belts and are moved by drive rollers and deflection rollers around a table and around a plunger. The plunger and the table have a variable pressure gap between them. The endless steel belts are interposed between the plunger and the table. A first plurality of endless steel belts abuts against the plunger and a second plurality of endless steel belts abuts against the table.

During the production of wood composition boards, fiber panels, plywood, and the like, it is necessary to subject the pressed material to high pressures and high temperatures in order to obtain the desired quality of the resultant product. These requirements are satisfied by one stage hot platen presses, which are intermittently operated. The output of such presses is, however, relatively low, so that the production of pressed material is low.

The disadvantage of low production is overcome by continuously operating presses wherein the material to be pressed is moved by two steel belts through the pressure gap between the table and the plunger. When wood composition boards are being produced, the end result is an endless panel. This is desirable, since it is homogenous in quality and presents very little cutting waste. Continuously operating presses have the disadvantage, however, that due to the great friction between the endless steel belts and the abutting surfaces of the table and the plunger, the pressure exerted upon the pressed material is insufficient. The pressure applied to the pressed material is insufficient, since such pressure depends upon the tenacity, strength, vulnerability, or the like, of the steel belts. Belts of suitable tenacity, strength and the like, are available only at specific thicknesses. The specific thickness of available steel belts, which is insufficient to withstand considerable forces, thus limits the forces which may be absorbed by said belts.

Some types of continuously operating presses, which apply high pressure to the material to be pressed, utilize steel belts which are pressed against the material by stationary or rotating balls or rollers, which are rotated by worm drives. The required high pressure, especially during the production of wood composition boards, cannot be provided to any extent by such presses. Furthermore, another disadvantage of this type of press is that due to the point and linear pressure transmission, the steel belts are subjected to considerable wear and tear, so that non-homogenous pressure transmission adversely affects the quality of the pressed material.

The principal object of the invention is to provide a new and improved continuously operating press.

An object of the invention is to provide a continuously operating press in which the high pressures required for the production of wood composition

boards are transmitted suitably and in a desirable manner without impairing the quality of the pressed material.

An object of the invention is to provide a continuously operating press which produces wood composition boards of good quality with efficiency, effectiveness and reliability.

A continuously operating press for producing wood composition boards, fiber panels, plywood, and the like, includes a table, a plunger and pressure means for applying pressure to the plunger to compress material between the plunger and the table. The plunger and the table have a variable pressure gap between them. Moving means moves the material between the plunger and the table during the application of pressure thereto. In accordance with the invention, the moving means comprises endless steel belt means interposed between and abutting against the plunger and the table. Roller means moves the steel belt means around the plunger and around the table. The endless steel belt means comprises a first plurality of endless steel belts for the plunger and a second plurality of endless steel belts for the table.

In a first embodiment of the invention the roller means comprises a plurality of drive rollers each driving a corresponding one of the first and second pluralities of endless steel belts and a plurality of deflection rollers each guiding a corresponding one of the first and second pluralities of endless steel belts.

In a second embodiment of the invention, the roller means comprises a first drive roller for driving the first plurality of endless steel belts, a first deflection roller for guiding the first plurality of endless steel belts, a second drive roller for driving the second plurality of endless steel belts and a second deflection roller for guiding the second plurality of endless steel belts.

In a third embodiment of the invention, the roller means comprises a first drive roller for driving the first plurality of endless steel belts, a first plurality of deflection rollers each guiding a corresponding one of the first plurality of endless steel belts, a second drive roller for driving the second plurality of endless steel belts and a second plurality of deflection rollers each guiding a corresponding one of the second plurality of endless steel belts.

In a fourth embodiment of the invention, the roller means comprises a first plurality of drive rollers each driving a corresponding one of the first plurality of endless steel belts, a first deflection roller for guiding the first plurality of endless steel belts, a second plurality of drive rollers each driving a corresponding one of the second plurality of endless steel belts and a second deflection roller for guiding the second plurality of endless steel belts.

The moving means may comprise a single driving means driving the drive rollers. This may be accomplished by a primary drive shaft or hydraulic gear. This insures that each of the steel belts has the same moving force applied thereto, since all the moving forces are applied from the principal drive shaft or other source of power. The principal drive shaft is preferably rotated at a speed at which the synchronization of the entire production line is attained.

A web of synthetic material is provided on the plunger interposed between the plunger and the first

plurality of endless steel belts and a second web of synthetic material is provided on the table interposed between the table and the second plurality of endless steel belts. The synthetic material of the first and second webs is polytetrafluorethylene. An alarm system may be electrically connected to the first and second webs in a manner whereby an alarm is actuated when either of the first and second webs is damaged. The first and second webs of synthetic material are utilized to avoid friction between the steel belts and the abutting surfaces of the plunger and the table.

In order that the invention may be readily carried into effect, it will now be described with reference to the accompanying drawings, wherein:

FIG. 1 is a schematic diagram of a first embodiment of the continuously operating press of the invention;

FIG. 2 is a schematic diagram of a second embodiment of the continuously operating press of the invention;

FIG. 3 is a schematic diagram of a third embodiment of the continuously operating press of the invention; and

FIG. 4 is a schematic diagram of a fourth embodiment of the continuously operating press of the invention.

In the FIGS. the same components are identified by the same reference numerals.

As shown in FIGS. 1 to 4, the press comprises a table 1 and a movable plunger 2 which is movably mounted with relation to said table and is moved toward and away from said table by a plurality of hydraulic pressure cylinders 4 which are suitably mounted. The plunger 2 is movably mounted, and guided in its movement, on a plurality of pressure or tension columns 3. There is thus a variable pressure gap between the plunger 2 and the table 1.

In order to reduce the friction between the steel belts and the abutting surfaces of the plunger 2 and the table 1, a first web 5 of synthetic material such as, for example, polytetrafluorethylene, is provided on the abutting surface of the plunger 2 and a second web 6 of synthetic material such as, for example, polytetrafluorethylene, is provided on the abutting surface of the table 1.

In accordance with the invention, a first plurality of three endless flexible steel belts 7, 9 and 11 are provided around the plunger 2 and interposed between said plunger and the table 1. A second plurality of endless flexible steel belts 8, 10 and 12 are provided around the table 1 and interposed between said table and the plunger 2.

In the first embodiment of the invention, as illustrated in FIG. 1, each of a plurality of drive rollers 13, 14 and 15 drives a corresponding one of the first plurality of endless steel belts 7, 9 and 11 and each of a plurality of drive rollers 13', 14' and 15' drives a corresponding one of the second plurality of endless steel belts 8, 10 and 12. Each of a plurality of deflection rollers 16, 17 and 18 guides a corresponding one of the first plurality of endless steel belts 7, 9 and 11. Each of a plurality of deflection rollers 16', 17' and 18' guides a corresponding one of the second plurality of endless steel belts 8, 10 and 12.

In the second embodiment of the invention, as illustrated in FIG. 2, a first drive roller 13 drives the first

plurality of endless steel belts 7, 9 and 11. A first deflection roller 16 guides the first plurality of endless steel belts 7, 9 and 11. A second drive roller 13' drives a second plurality of endless steel belts 8, 10 and 12. A second deflection roller 16' guides the second plurality of endless steel belts 8, 10 and 12.

In the third embodiment of the invention, as illustrated in FIG. 3, a first drive roller 13 drives a first plurality of endless steel belts 7, 9 and 11. Each of a first plurality of deflection rollers 16, 17 and 18 guides a corresponding one of the first plurality of endless steel belts 7, 9 and 11. A second drive roller 13' drives the second plurality of endless steel belts 8, 10 and 12. Each of a second plurality of deflection rollers 16', 17' and 18' guides a corresponding one of the second plurality of endless steel belts 8, 10 and 12.

In the fourth embodiment of the invention, as illustrated in FIG. 4, each of a first plurality of drive rollers 13, 14 and 15 drives a corresponding one of the first plurality of endless steel belts 7, 9 and 11. A deflection roller 16 guides the first plurality of endless steel belts 7, 9 and 11. Each of a second plurality of drive rollers 13', 14' and 15' drives a corresponding one of the second plurality of endless steel belts 8, 10 and 12. A second deflection roller 16' guides the second plurality of endless steel belts.

In each of the embodiments of the press of the invention, the endless steel belts 7, 9 and 11 of the first plurality of endless steel belts are positioned juxtaposition and the endless steel belts 8, 10 and 12 of the second plurality of endless steel belts are positioned in juxtaposition.

The press of the invention provides the advantage that the moving force is considerably increased, thereby transmitting a higher pressure on the material to be pressed. This is due to the utilization of a plurality of steel belts around the plunger 2 and a plurality of steel belts around the table 1.

Another advantage of the press of the invention is that larger surfaces may be pressed thereby.

While the invention has been described by means of specific examples and in specific embodiments, I do not wish to be limited thereto, for obvious modifications will occur to those skilled in the art without departing from the spirit and scope of the invention.

I claim:

1. In a continuously operating press for producing wood composition boards, fiber panels, plywood, and the like, including a table, a plunger and pressure means for applying pressure to the plunger to compress material between said plunger and said table, said plunger and said table having a variable pressure gap between them, moving means for moving the material between said plunger and said table during the application of pressure thereto, said moving means comprising endless steel belt means interposed between and abutting against said plunger and said table, and roller means for moving the steel belt means around said plunger and around said table, said endless steel belt means comprising a first plurality of endless steel belts for the plunger and a second plurality of endless steel belts for the table.

2. A continuously operating press as claimed in claim 1, wherein said roller means comprises a plurality of drive rollers each driving a corresponding one of said

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first and second pluralities of endless steel belts and a plurality of deflection rollers each guiding a corresponding one of said first and second pluralities of endless steel belts.

3. A continuously operating press as claimed in claim 1, wherein said roller means comprises a first drive roller for driving said first plurality of endless steel belts, a first deflection roller for guiding said first plurality of endless steel belts, a second drive roller for driving said second plurality of endless steel belts and a second deflection roller for guiding said second plurality of endless steel belts.

4. A continuously operating press as claimed in claim 3, wherein said roller means comprises a first drive roller for driving said first plurality of endless steel belts, a first plurality of deflection rollers each guiding a corresponding one of said first plurality of endless steel belts, a second drive roller for driving said second plurality of endless steel belts and a second plurality of deflection rollers each guiding a corresponding one of said second plurality of endless steel belts.

5. A continuously operating press as claimed in claim 1, wherein said roller means comprises a first plurality of drive rollers each driving a corresponding one of said first plurality of endless steel belts, a first deflection

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roller for guiding said first plurality of endless steel belts, a second plurality of drive rollers each driving a corresponding one of said second plurality of endless steel belts and a second deflection roller for guiding said second plurality of endless steel belts.

6. A continuously operating press as claimed in claim 1, wherein said moving means further comprises a single driving means driving said roller means.

7. A continuously operating press as claimed in claim 1, further comprising a first web of synthetic material on said plunger interposed between said plunger and said first plurality of endless steel belts and a second web of synthetic material on said table interposed between said table and said second plurality of endless steel belts.

8. A continuously operating press as claimed in claim 7, wherein the synthetic material of said first and second webs is polytetrafluorethylene.

9. A continuously operating press as claimed in claim 7, further comprising alarm means electrically connected to said first and second webs in a manner whereby said alarm means is actuated when either of said first and second webs is damaged.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,680,476 Dated August 1, 1972

Inventor(s) Heinrich Pfeiffer

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the heading to the printed specification, line 9,
"P 19 34 784.3" should read -- P 19 39 784.3 --

Signed and sealed this 20th day of November 1973.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

RENE D. TEGTMEYER
Acting Commissioner of Patents