March 1, 1960 J. BOBST 2,926,908

PRESS AND A GRIPPER BAR DEVICE THEREFOR

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Fig.1.

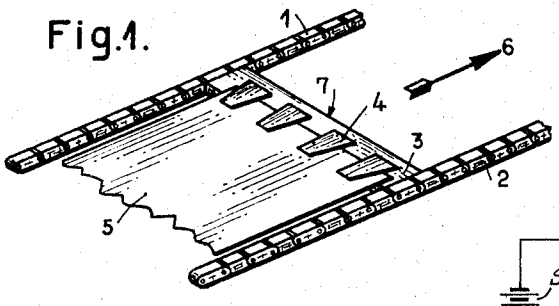


Fig.2.

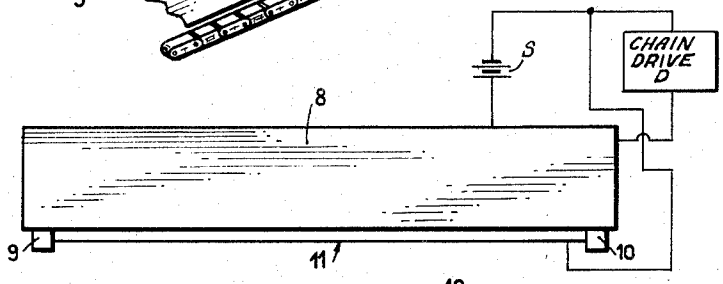


Fig.3.

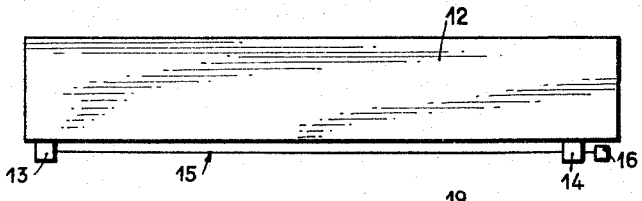


Fig.4.

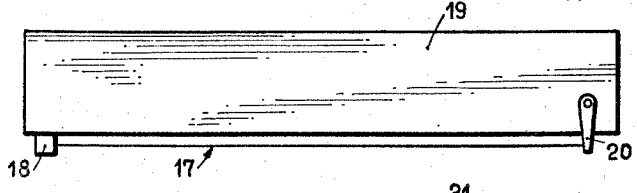


Fig.5.

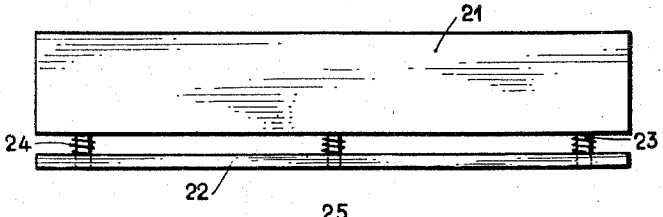
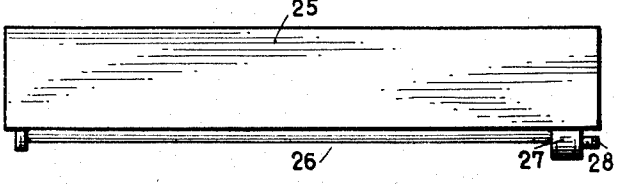


Fig.6.



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PRESS AND A GRIPPER BAR DEVICE THEREFOR

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16 Claims. (Cl. 271—47)

This invention relates to safety devices for presses.

Some presses for working sheet material such as, for instances, paper, cardboard or corrugated cardboard, convey said sheets by means of gripper bars driven by endless chains which the gripper bars span transversally to the conveying direction.

The present invention is concerned with presses of this kind and is designed to prevent the undesirable consequences of what is generally known as "cramming," i.e. an accident by which a folded or crumpled sheet or the like obstructs the passage of the gripper bars.

The conveying function in known presses takes place intermittently and at a cadence which may be very rapid. If obstructions suddenly occur against the passage of a gripper bar, while the chains continue to drive the same, the bar may be warped or even broken or the chains strained or distorted.

In order to avoid the above-mentioned damage, the present invention provides for attaching to at least one of these gripper bars a member extending in parallel to an associated bar and between the chains and preceding the bar in its displacements in which it takes part, this member operating on means to cause the press to stop as soon as an obstacle is met.

To faciiitate an understanding of the invention, some preferred embodiments thereof will next be described with reference to the accompanying drawing in which:

Fig. 1 illustrates, in perspective, a gripper bar arrangement; and

Figs. 2–6 represent respective embodiments of the invention.

Fig. 1 shows sections of two endless chains 1 and 2 between which is a gripper bar 3, which links the chains and supports grippers 4 which hold and convey a sheet 5 in the direction of arrow 6.

The provision of the invention can be provided on the gripper bar itself, for instance at 7 in the aforesaid figure, or on the chains themselves in front of the bar relatively to the conveying direction.

Though it is possible to provide for such a protection in front of one bar only, it is evident that a press in order to be well protected against the unwelcome consequences of cramming, will preferably have a protection member in front of each bar.

The means operated by such organs can be electric, or still pneumatic, hydraulic or mechanical.

Figs. 2 to 6 of the attached drawing show five embodiments of the invention given as examples and in the particular case where the contemplated members are borne by the gripper bars (the grippers of which are not shown).

All these bars travel downward in relation to the drawing, so that the front face to be considered is represented by the lower edges thereof.

The gripper bar 8 of Fig. 2 bears at both ends of its front face, two blocks 9 and 10, between which a wire 11 is stretched. The bar 8 being metallic and the wire being metallic as well, it will be sufficient to insulate these two elements from each other electrically, for instance, by

making the blocks 9 and 10 non-conductive, and to incorporate them into an electrical circuit in order to control the stopping of the press when the wire 11 hits an obstacle and is forced against the bar 8.

The working of this arrangement is more particularly as follows: as the front part of the bar 8 approaches an obstacle, the wire 11 strikes the obstacle; said wire comes into contact with bar 8, thus closing the electrical circuit including the wire and the bar as a switch. This circuit on closing causes the associated press to stop immediately.

More particularly, as indicated in Fig. 2, a source S of electrical power and a chain drive D are coupled by a brush arrangement (not shown) to bar 8 in a closed circuit. Contact of wire 11 with bar 8, however, short circuits source S so that the drive of the chain is terminated.

It will be appreciated that the wire flexibility can be selected as desired, or that one of the ends of the wire can be fixed by means of a spring. Finally, the wire can also be replaced by a small deformable rod or bar.

In the second embodiment, shown in Fig. 3, gripper bar 12 supports two blocks 13 and 14 fixed to both ends of its front face and between which wire 15 is stretched. This wire is fixed to block 13 but passed through block 14, being fixed beyond this latter to part 16 which can either be mobile or contain a switch.

In the first case, the part 16 can be shifted against block 14 and close a circuit when meeting with it. In the second case, the switch will make it possible either to close or to open a circuit when the wire is subjected to a force.

One or the other of the above mentioned actions will modify the state of an electric circuit and allow the press to be stopped as soon as the wire encounters an obstacle.

In the third embodiment shown in Fig. 4, wire 17 fixed by block 18 to one of the front face ends of gripper bar 19 is fixed at its other end to a lever 20 connected to said bar.

Any pull exerted on the wire will make lever 20 pivot to cause either the closing or opening of an electrical circuit.

In the fourth embodiment of Fig. 5, bar 21 is paralleled on its front face, by an auxiliary bar 22 slidable on guides 23 against the action of springs 24, tending to maintain it at a short distance from main bar 21.

When this auxiliary bar 22 meets with an obstacle, it is pushed against the bar and this motion can be utilized either to establish contact between bars 22 and 21, if they are electrically insulated from each other or to operate a push-button device or the like provided to modify the state of an electrical circuit or to compress a fluid (liquid or gas).

As the gripper bars are moved at high speed and since it would be hardly possible to utilize the chains as the poles of an electrical circuit, an electrical circuit will be made to pass through a contact rail and brush arrangement (not shown). The rail need only be disposed along the part of the trajectory of each bar where a cramming is likely to occur such as between the station where the sheets are inserted into the clamps and the associated working station or ejecting station, according to the type of machine.

Along this path, the trajectory is linear, so that the solution contemplated is a very simple matter.

In the case of the compression of a fluid, it is necessary to resort to other means. The following example gives a solution which may be applied in such a case.

In the fifth embodiment of Fig. 6, gripper bar 25 supports a compressible tube 26 of rubber or plastic material, for instance closed at one end and connected at its other end to a small cylinder 27, containing a piston, the rod of which is seen protruding at 28.

The control is thus pneumatic in the sense that, if the

front part of the bar meets with an obstacle tending to crush tube 26, there results in the tube an increase of air pressure which is transmitted to cylinder 27, thus pushing the piston and piston rod 28 to the right in the drawing.

This shifting, which might take any other direction, can be uitlized either to open or to close an electrical circuit passing through the gripper bar, and a contact rail might be met by rod 28 or by a member borne by rod 28. Alternatively, rod 28 might be used to shift the rail mechanically with a view to controlling the stoppage of the press by hydraulic or pnuematic means exclusively. The tube 26 could, indeed, also contain a liquid instead of a gaseous medium.

It is evident that the described arrangements could also be realized by means of members borne immediately by the chains instead of the bars but, of course, preceding the bars in their displacements.

Thus, for example, conducting wire 11 of the example of Fig. 2 could be stretched between two chain links, from which it would be insulated, however lying at a distance from the bar such as to enable the wire, when strained, to come into contact with the bar.

What I claim is:

1. A press comprising an endless conveyance device, first means coupled to and driving said endless conveyance device, a gripper bar device on and driven by said endless conveyance device, and second means supported at least in part on one of said devices in substantially fixed relation to said gripper bar device and ahead of the same with regard to a normal direction of travel thereof, said second means being operatively associated with said first means and response to obstacles in the path of said gripper bar device to render said first means inactive.

2. A press as claimed in claim 1 wherein said second means comprises an electric circuit controlling said first means.

3. A press as claimed in claim 2 wherein said second means comprises mechanical means controlling said first means.

4. A press as claimed in claim 2 wherein said second means comprises pneumatic means controlling said first means.

5. A press as claimed in claim 2 wherein said second means comprises hydraulic means controlling said first means.

6. A press as claimed in claim 1 wherein the endless conveyance device comprises spaced chains and said gripper bar device is a bar extending between the chains, said second means including an elongated member supported on and parallel to said bar.

7. A press as claimed in claim 6, wherein the elongated member is a metal wire and said bar is metallic, comprising insulating members connecting the wire to said bar, deformation of the wire by an obstacle causing contact between the wire and bar.

8. A press as claimed in claim 6, wherein the elongated member is a cantilever member adapted for operating a switch.

9. A press as claimed in claim 6, wherein the elongated member is a tube containing a medium adapted for operating a piston.

10. A gripper bar assembly for a press comprising a movable bar having leading and trailing edges, a displaceable elongated element parallel to the leading edge, and means supporting the elongated element on said bar for movement with the latter, said element being positioned ahead of the bar with respect to its direction of travel for intercepting obstacles.

11. An assembly as claimed in claim 10 wherein said means supports the elongated element fixedly at at least one end of the element.

12. An assembly as claimed in claim 10 wherein said bar and element are metallic for constituting cooperating electrical contacts and said means is constituted by insulating members.

13. An assembly as claimed in claim 10 wherein said means supports said element with the latter resiliently displaceable in entirety.

14. An assembly as claimed in claim 10 comprising a switch operatively associated with said element.

15. An assembly as claimed in claim 10, wherein said element is a tube containing a displaceable medium, comprising an actuator responsive to said medium.

16. A conveyor device comprising conveyance means, engagement means on said conveyance means for engaging an item to be conveyed, detector means supported on one of the aforesaid means for movement with and ahead of the engagement means, and control means operatively associated with the detector and conveyance means to halt the latter with the detector means encountering an obstacle.

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