

June 20, 1950

H. BOBST
CENTERING DEVICE FOR GRIPPER BARS
IN SHEET HANDLING MACHINES

2,512,084

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2 Sheets-Sheet 1

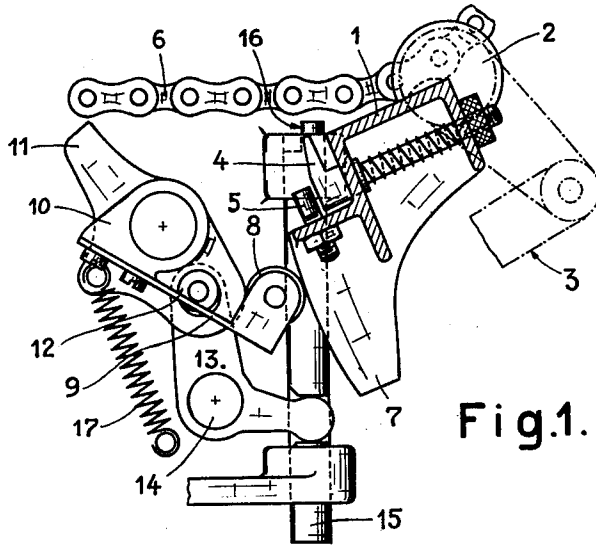


Fig. 1.

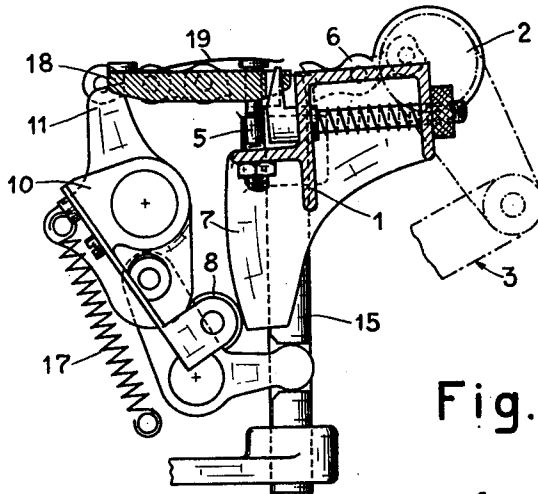


Fig. 2.

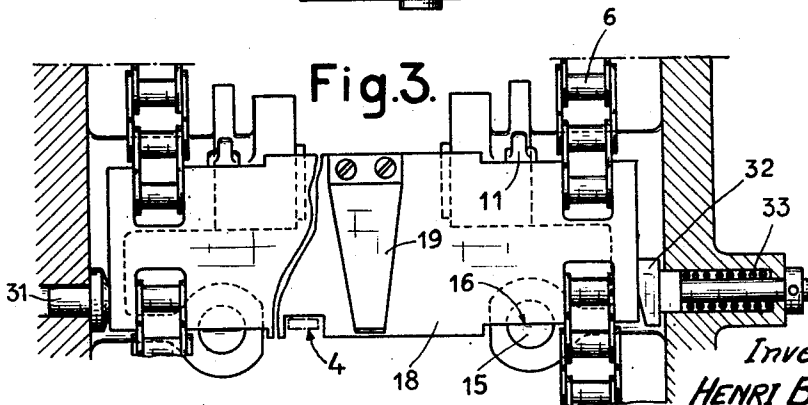


Fig. 3.

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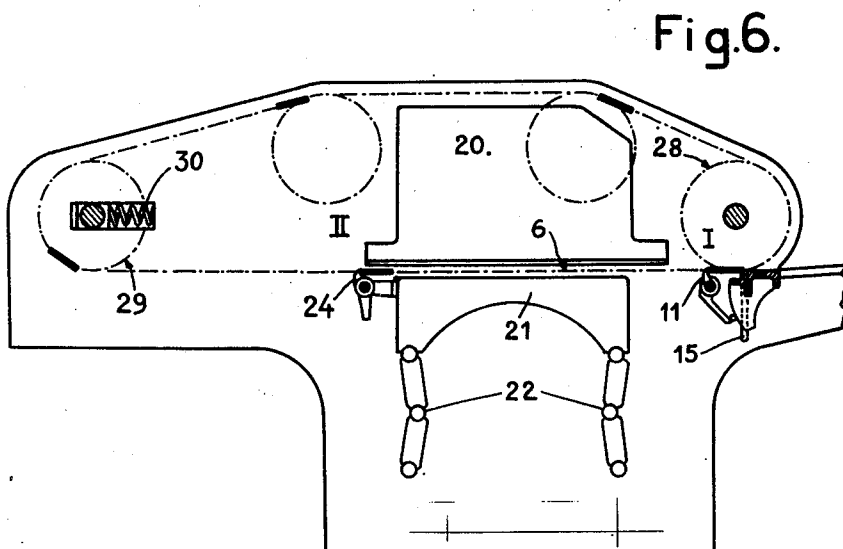
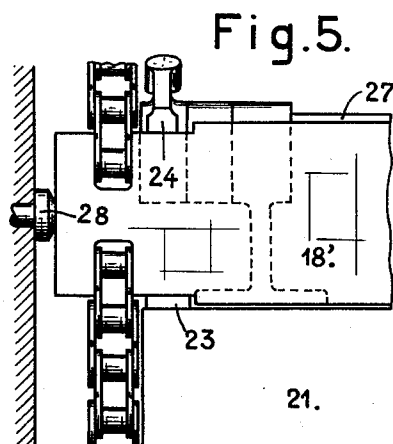
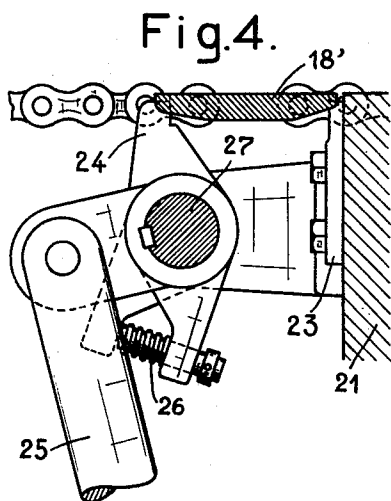
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UNITED STATES PATENT OFFICE

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CENTERING DEVICE FOR GRIPPER BARS IN
SHEET HANDLING MACHINES

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6 Claims. (Cl. 271-50)

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In presses working sheet-like materials, as for example cardboard, carried by gripper bars, it is necessary to ensure the centering of said bars with regard to the registering station, where the sheets are seized and the working station, where the latter must occupy a well determined position.

The bars being carried by chains, it is necessary on the one side, to submit these latter to the action of relatively powerful stretching means, which ensure, at the rapid cadence, a correct displacement of the bars, but it is also indispensable to be able momentarily to relax certain sections of these chains, in order to make the centering possible.

This last operation has already been effected by means of conical centering dowels penetrating into corresponding openings of the bars. However, this device is not very satisfactory as the resistance opposed by the tension to the penetration of the dowel can easily produce an awkward raising of the bars, whereas the pin cone must be able to provoke a sufficient displacement of the bar so as to compensate the great stretching to which the chains are subject after a certain use. This is contrary to the condition of being able to overcome the tension to which the chains are submitted, which can in fact only be effected by a relatively taper cone, and this not without hard wear. The distances between the holes in the bars and the position of the pins must also be very exactly determined which creates certain difficulties and moreover the whole device works at a disadvantage owing to the presence of dust from the cardboard which is being worked.

Tests have already been made in order to center the bars by acting on the links of the chains, but the play and not-round-working as well as the raising of these latter, are other causes of inexactitude. It is the same for the locking of the driving wheels, in order to immobilize a certain number of links, or the bar itself, when engaged in their teeth.

The object of the invention is to replace all these dispositions by positive abutments, which are placed on the trajectory of the extremities of the bars in the immediate neighbourhood of at least one of their stations, abutments against which pressing organs provoke the support of a predetermined part of the said extremities, by displacing the bars for such a quantity that the normally stretched chain is obliged to yield up.

This operation will generally be executed simultaneously at the margin station and at the working station. At this latter point, the positive

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abutments could for example be carried along by the movable plate of the press.

The annexed drawing shows an embodiment of the object of the invention, given by way of example.

Fig. 1 shows that part of the device which is at the registering station, before a bar arrives.

Fig. 2 shows the same part operating the centering of a bar which

Fig. 3 shows in plane view.

Fig. 4 shows the centering of a bar at the working station.

Fig. 5 is a corresponding plane view and

Fig. 6 a complete view of the press showing the distribution of the described parts.

The part of the device represented on Figs. 1 and 2 is composed of the registering board 1, shown in transversal cross section, and which oscillates around the pivot 2 under the action of a lever and of a driving connecting rod 3.

This board bears forward registering works 4, which position can be exactly adjusted and the abutment 5, destined to provoke the opening of the grippers of the bars carried between two chains, one of which 6 is to be seen.

The board 1 bears also, at each extremity, a cam 7, against which leans a roller 8, which an elastic blade connects with a sleeve 10 joined to a lever ending at one of its extremities by the hook 11, and at the opposite extremity, by an elongated eyelet into which penetrates a roller 12 joined to a cranked lever 13.

This lever, which turns around the shaft 14, penetrates into an axially sliding rod 15, the upper extremity of which ends by a flat part 16.

A spring 17 seeks to bring the whole back to the resting position shown on Fig. 1, i. e. rod 15 being down and hook 11 drawn backwards, in order to give free passage to a bar by the chains.

But as soon as such a bar reaches the position 18 of Fig. 2, i. e. is placed between the prolongation of the flat part of rod 15 and the hook 11, the connecting rod 3 brings the registering board 1 back to its horizontal position, which has for result to allow the forward registering marks 4 to penetrate into corresponding notches of the bar (see Fig. 3), while abutments 5 open the grippers by the spring blades 19 of the bar, the cam 7 pushing back the roller 8.

There results the simultaneously raising of the rods 15 and oscillating of the hooks 11 in the direction of the flat parts 16 of said rods. The bar is pressed against these organs and leans positively against the flat surfaces.

A sheet, correctly registered by the forward

marks 4 is introduced into the grippers of the bar having just been liberated by an operation inverse to that which has just been described in order to ensure its conveyance to the working station.

It is obvious that the form of cam 7 must be such, with regard to the disposition of the organs which it operates, that the grippers 19 will close and the forward marks 4 disappear from before the front edge of the cardboard sheet, before the pressure exerted by hook 11 be suppressed.

It is also evident that the described mechanism must be able to overcome the tension which is communicated to the chains in order to allow of the slight backward movement of the bar 18 ensuring thus its application against the flat parts 16.

These latter forming positive abutments of sufficient dimensions are not subjected to wear and will therefore always ensure a correct and well determined position of the bars.

The registering station which has just been described is designated by I on the general view (Fig. 6).

From there, the bar goes to the working station II and passes between the upper fixed plate and the mobile lower plate 21, driven by toggle joints 22.

Fig. 4 shows in detail how the bar is again centered on arriving at this station.

Stopping at 18', immediately behind the lower mobile plate 21, the bar is caught at each extremity between a key 23 of the plate and the hook 24 of a lever positively operated by the intermediary of a driving connecting rod 25 and of an elastic joint 26, this hook being normally drawn backward in order to give free passage to the bars.

The plane view of Fig. 5 shows obviously the position of the chain 6, of the bar 18', of plate 21, of key 23, of hook 24 and of shaft 27, common to the tightening levers affecting both extremities of the bar and supported by brackets joined to the plate.

In fact, it is necessary that the key and the grippers move upward and downward with the plate, in order to oblige the bar to follow this movement.

At this station, as well as at the first one, the support of the bars is carried out in a positive manner against a surface largely dimensioned.

It is obvious that the obtained backward movement of the gripper bar must be slightly greater in station II than in station I, in order that the section of the chain, comprised between these two stations, may be very slightly slackened.

This will always be the case if the chains are driven in I by means of the wheels 28, the chains being stretched in 29 by the springs 30.

Would the driving be elsewhere effected, this would only have for consequence, should the case happen, to necessitate the inversion of the action of the described device, i. e. the positive abutment would come behind the bar, instead of in front of it, and the pressing organ would be placed in front instead of behind.

The described centering action has an influence on the position of the extremities of the bars in the carrying direction. It can also be useful to ensure its exact position on a transversal direction with regard to the carrying direction.

In the described examples, this result is obtained in the two stations by making the bar

pass between a fixed abutment 31 of the machine's frame and a block 32 submitted to the action of a spring 33 and operating on the bar a lateral pressure, which obliges it to lean against the abutment 31.

What I claim is:

1. In a press or the like for working sheets carried by gripper bars, wherein the bars are conveyed by a pair of parallel chains, each of said chains being trained over a driving sprocket and provided with tensioning means for taking up the slack therein; a centering device located in the immediate vicinity of at least one working station of the press comprising positive abutments movable into and out of the path of travel of the bars at the extremities thereof and at the side of the bars facing away from the direction in which the chains are tensioned, means moving said abutments into and out of the path of travel of said bars, and means pressing said bars against said positive abutments in opposition to the tensioning means to thereby center said bars.

2. A press or the like for working sheets comprising gripper bars for carrying the sheets through the press, a pair of continuous parallel chains conveying said bars, a driving sprocket for each of said chains over which the latter are trained, tensioning means engaging each of said chains and taking up the slack therein, and a centering device located in the immediate vicinity of at least one working station of the press including positive abutments movable into and out of the path of travel of said bars at the extremities of the latter and at the side of the bars facing away from the direction in which the chains are urged by said tensioning means, means moving said abutments into and out of the path of travel of said bars, and means pressing said bars against said positive abutments when the latter are positioned in the path of travel of said bars and in opposition to said tensioning means to thereby center said bars.

3. A press or the like for working sheets comprising an upper fixed platen and a lower movable platen; a pair of parallel continuous chains having runs in a plane passing between the confronting surfaces of said upper and lower platens; a driving sprocket for each of said chains over which the latter are trained; tensioning means engaging each of said chains for taking up the slack therein; a plurality of gripper bars carried by said chains between said upper and lower platens and spaced apart a distance substantially greater than the length of said platens; first centering means at the sheet taking station in advance of said platens including positive abutments moving into and out of the path of travel of said bars at their extremities and at the side of said bars facing away from the direction in which the chains are urged by said tensioning means, and means pressing the bar at said sheet taking station against said positive abutments when the latter are disposed in the path of travel; and second centering means at the working station immediately after said platens including positive abutments moving into and out of the path of travel of said bars at their extremities and at the side thereof facing away from the direction in which said chains are urged by said tensioning means, the distance between said positive abutments of said first centering means and said last mentioned positive abutments being less than the spacing between adjacent ones of said gripper bars as carried by said chains, and means pressing the bar at the working station against

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said last mentioned positive abutments simultaneously with the operation of the first mentioned pressing means whereby said bars are centered against the action of said tensioning means and the portions of the chains between said working station and said sheet taking station are rendered slack to permit centering of the gripper bar at the latter station.

4. A press or the like for working sheets according to claim 3; wherein each of said gripper bars include gripper fingers normally spring urged to closed position and a gripper opening plunger engaging each of said fingers; including a transverse oscillating registering board immediately in advance of said sheet taking station having lugs thereon contacting said gripper opening plungers for opening said fingers when said board approaches its upward terminal of oscillation, sheet registering stops for registering a sheet at said sheet taking station while said gripper fingers are open, and an operating cam for actuating said first centering means; and wherein said first centering means includes a rockable shaft, a resilient arm extending radially from said shaft, a cam follower on said resilient arm engaging said cam on said registering board whereby said shaft is rocked in response to the oscillation of said board, said pressing means including levers mounted on said shaft and having portions thereof swinging into the path of travel of the bar as said sheet taking station and against the side thereof facing in the direction of the tensioning of said chains, and means operatively connected to said shaft moving said positive abutments into the path of travel of said bars simultaneously with the swinging of said lever portions into said path of travel whereby the bar at said sheet taking station is centered simultaneously with the registering of a sheet by said registering board.

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5. A press or the like for working sheets according to claim 3; wherein said positive abutments of said second centering means consist of keys fixed to the trailing edge of said lower movable platen and moving into the path of travel of said bars when said lower platen is raised; and wherein said pressing means of said second centering means includes a transverse shaft rockably carried by said lower platen, means oscillating said shaft simultaneously with the raising of said lower platen, pressing levers on said shaft resiliently connected to the latter and swinging into the path of travel of the bar at said working station and against the side thereof facing in the direction of the tensioning of the chains for urging said bar against said keys whereby the bar at said working station is centered relative to the platens.

6. A press or the like for working sheets according to claim 3; including transverse centering means at said sheet taking station and at said working station engaging the opposite ends of the bars at said sheet taking and working stations to thereby center said bars in a direction at right angles to their direction of movement through the press.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,138,405	Huck	Nov. 29, 1938
2,221,500	Upham	Nov. 12, 1940
2,258,880	Bobst	Oct. 14, 1941