Nov. 16, 1926. 1,607,142

B. C. WHITE

SHEET GRIPPER

Filed Nov. 12, 1921

Fig. 1.

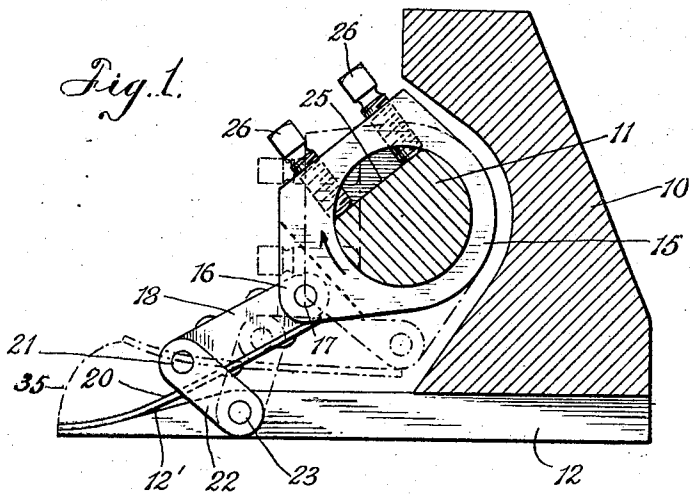


Fig. 2.

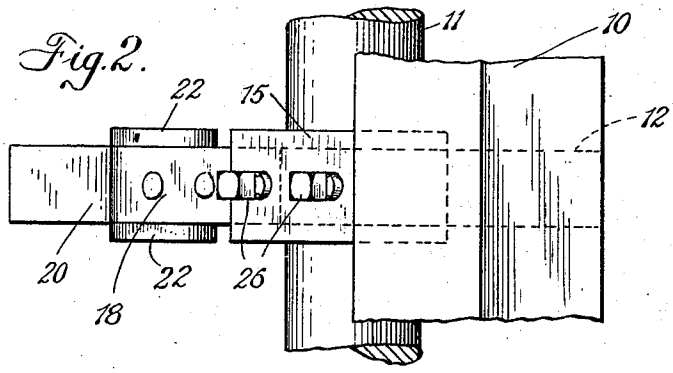
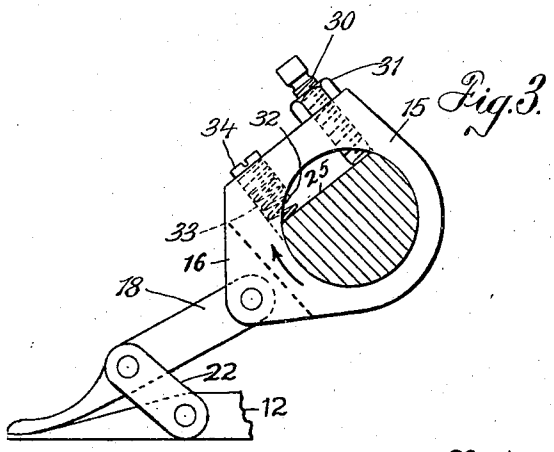


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SHEET GRIPPER.

Application filed November 12, 1921. Serial No. 514,684.

This invention relates to sheet grippers for printing presses, being intended more particularly for use on presses of the type in which the sheet travels around with a rotating member to be engaged by the printing elements. Presses of this type have been illustrated in previous patents such as the one described in Patent No. 1,306,086 dated June 10, 1919, in which the grippers are used in connection with a carrier ring.

While I have designed my improved sheet grippers more especially for use on this type of press I do not limit myself to this particular use thereof, and furthermore certain features of the present invention may be employed with advantage in connection with other parts or mechanisms of printing presses or other machines.

The invention has for a general object to provide an improved type of sheet gripper.

More specifically speaking, the invention has for an object to provide sheet grippers of simple construction in which the sheet is gripped through toggle means which act also to draw back the movable finger in a longitudinal direction and leave the tip of the fixed finger projecting to receive the sheet.

A further object of the invention is to provide an improved means for securing an operating arm, which may form part of the gripper or be applied to other purposes to its operating shaft.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly pointed out.

Fig. 1 of the drawings is a side elevation of a sheet gripper constructed according to the invention, the supporting bar and operating shaft being shown in transverse section.

Fig. 2 is a plan view thereof.

Fig. 3 is a fragmentary view showing a modified means for fastening the gripper on the operating shaft.

In the drawings the reference numeral 10 indicates a bar which, in the application of the invention to presses of the type above referred to, extends between and is rigidly fixed at its ends to a pair of parallel rotary rings, commonly called carrier rings, and which advance the sheet to the printing means. The reference numeral 11 indicates a rock-shaft by which the movable finger of the gripper is operated, this shaft being suitably journaled at opposite ends in the carrier rings and being adapted to be rocked in a well known manner by a cam (not shown).

Fixed to the underside of bar 10 is a transversely projecting rigid finger 12, between which and the movable finger operated by shaft 11, the sheet is gripped. While I have designated the fixed finger as being secured to the under side of the bar, this being the position shown in the drawings, and the positions of the other parts are referred to in like manner, the bar is arranged on the carrier rings to have the finger projecting in an approximately tangential direction. The finger 12 projects under the shaft 11 which is located at one side of the bar 10. For operating the movable finger I provide a pair of toggle arms one of which comprises a short forked projection 16 from a hub 15 mounted on the shaft 11 directly above the finger. This arm 16 has pivoted thereto, as indicated at 17, the other toggle arm 18, which latter carries the movable finger of the gripper which is here shown in Fig. 1 in the form of a flat resilient strip 20 which is secured to the underside of the latter arm and projects therefrom as shown to engage the end of the finger 12. The end portion of the finger 12 is preferably beveled off on its top face as shown at 12′, this beveled portion being slightly concaved in its outer half as shown, while the finger 20 preferably has a complementary curvature at its outer end.

To obtain the desired movement of the finger 20 the outer end of the arm 18 is pivotally connected as at 21 to the upper ends of a pair of rigid links 22 whose opposite ends are pivotally connected to the fixed finger as at 23, these links causing the thrust of the toggle arms to be transferred into a downward pressure of the finger 20 on the fixed finger 12. The gripper is closed by rocking shaft 11 in the direction indicated by the arrow, moving the toggle arms 16, 18 from the buckled position shown in broken lines to the nearly dead centered position shown in full lines. As will be apparent the arm 18 thrusts outwardly on the links 22 which extend upwardly and outwardly at an acute angle to the fixed finger 12 when the gripper is closed, and in conse-

quence the outward thrust of the arm 18 is transferred by the links 22 to a downward thrust toward the fixed finger, the leverage secured by the toggle being thus applied to the finger 20 to clamp it against the finger 12, the path of the movable finger 20 being indicated by the broken line 35.

As will be apparent also, the working of shaft 11 in a direction to open the gripper causes the arm 18 and finger 20 to have a longitudinal retracting movement with relation to the fixed finger 12, withdrawing the tip of finger 20 sufficiently to clear the edge of the sheet which is engaged by the end of the fixed finger 12. As the gripper opens, the outer end of arm 18 swings upwardly and the inner end swings downwardly imparting a tilting movement to finger 20 which lifts it off the fixed finger 12.

To enable the closing pressure of the gripper to be adjusted as desired I have devised a means for securing the arm 16 on the shaft 11 whereby slight angular adjustments may be readily obtained. As shown in Fig. 1 the shaft 11 is formed to present a flattened surface 25, which may be obtained by grooving the shaft transversely or flattening the same on one side throughout any desired portion of its length. In the application of the invention as in Fig. 1 the shaft is preferably grooved so as to localize the arm 16 above the finger 12. This flattened surface is engaged at opposite sides by the ends of a pair of abutment screws 26 which are threaded through the hub 15, being approximately vertical to the surface 25. These screws 26 act to hold the hub 15 and integral toggle arm 16 against rotation on the shaft 11, and it will be apparent that by loosening one screw and tightening the other the arm can be given a limited angular adjustment on the shaft.

In Fig. 3 of the drawings I have shown a modified means for adjustably securing the toggle arm 16 on the shaft 11. In this construction a screw 30 bears against one side of the surface 25 and may be provided with a lock-nut 31. The other side of the surface 25 is engaged by one end of a coiled expansion spring 32 located in a recess 33 in the hub 15, a screw 34 being threaded into the outer end of the recess 33 and forming an adjustable abutment for the spring. When the shaft 11 moves in the direction shown by the arrow to close the gripper it acts on hub 15 through spring 32, providing resilient pressure means acting to close the movable finger, the pressure being readily adjusted by tightening or loosening screw 34.

It is to be understood that I do not limit myself to any particular application of the means here shown for securing the arm to shaft 11. The same may be applied to other types of grippers, or to other arms or cams, the term arm, as applied to this feature in the claims being used in a broad sense to include any part or element.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is as follows:

1. A sheet gripper comprising a pair of fingers, one thereof being resilient with respect to the other, a pair of toggle arms, one of said arms carrying one of said fingers, and a link connecting said fingers together.

2. In a sheet gripper, a fixed finger, a movable finger, a link pivotally connecting said fingers together, and a shaft connection arranged to effect an adjustable gripping engagement between said fingers and to move one of said fingers both toward and away from and longitudinally of the opposite finger.

3. A sheet gripper comprising a pair of fingers, a link pivotally connecting said fingers together, and a rock-shaft connection pivoted to one of said fingers and operating through said link to effect a gripping movement between said fingers, the said gripping movement extending in a line substantially perpendicular to the clamping faces of said fingers.

4. In a sheet gripper including a carrier-bar, a finger fixed to said carrier-bar, a rock-shaft movable with said carrier-bar and extending transversely of said fixed finger, a toggle arm fixed to said rock-shaft, a toggle member pivoted to said toggle arm and having a finger movable therewith, and a link pivotally connecting the toggle member and fixed finger together.

Signed at New York, in the county of New York and State of New York this 9th day of November, A. D. 1921.

BRUCE CLARK WHITE.