

Oct. 4, 1938.

H. B. ALLEN

2,132,283

SUCTION TIP

Filed Jan. 6, 1937

Fig. 1.

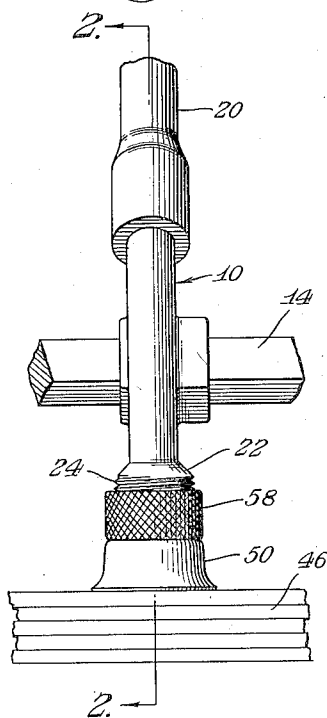


Fig. 2.

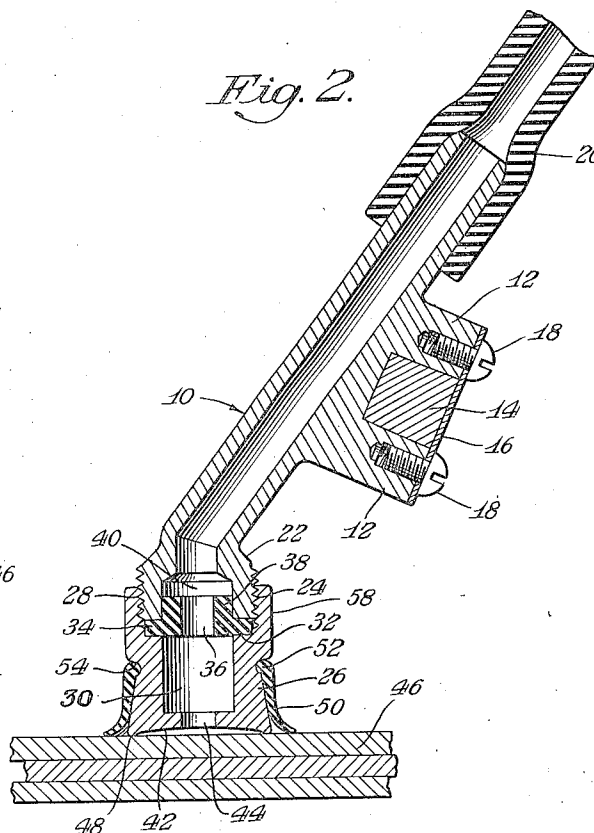


Fig. 3.

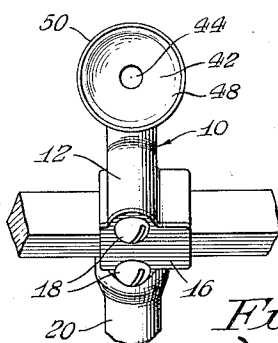


Fig. 4.

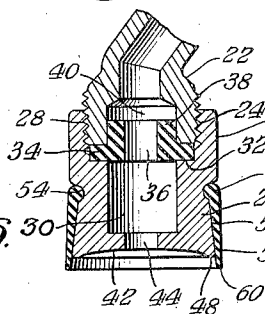


Fig. 5.

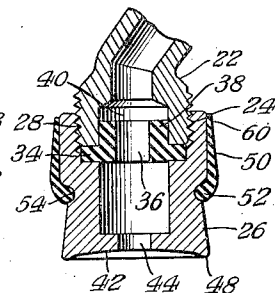
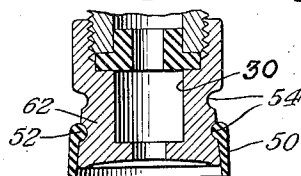


Fig. 6.



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UNITED STATES PATENT OFFICE

2,132,283

SUCTION TIP

Harry Bedford Allen, Highland Park, Mich.

Application January 6, 1937, Serial No. 119,356

2 Claims. (Cl. 294—64)

My invention relates to printing presses, and includes among its objects and advantages the provision of an improved suction tip embodying improvements over the suction tip illustrated in my co-pending application, Serial No. 103,441, filed September 30, 1936.

In the above-identified co-pending application the suction tip comprises metal designed to successfully handle approximately ninety-five per cent of the paper passing through the printing press. In cases where relatively heavy and irregularly shaped or exceptionally rough surface heavy paper is being handled, it is necessary to employ a flexible tip. Under such conditions it is necessary to remove the metallic suction tip and substitute a tip of a flexible nature.

An object of my invention is to provide a metallic suction tip embodying an auxiliary flexible tip which is carried by the metallic tip but so related thereto as to permit the flexible tip to be adjusted to an inoperative position on the metallic tip, thereby eliminating the necessity of removing the metallic tip.

A further object is to provide a metallic suction tip which serves as a mounting for the flexible tip and in which means is employed for adjusting the flexible tip to compensate wear.

In the accompanying drawing:

Fig. 1 is an elevational view of a conventional tip supporting body illustrating my invention applied thereto;

Fig. 2 is a sectional view along the line 2—2 of Fig. 1;

Fig. 3 is a bottom plan view of the structure illustrated in Fig. 1;

Fig. 4 is a sectional view of the metallic tip and the flexible tip attached thereto with the tip in its operating position;

Fig. 5 is a view similar to Fig. 4 showing the flexible tip adjusted to an inoperative position; and

Fig. 6 is a sectional view of a tip embodying compensation for wear of the flexible part.

In the embodiment selected to illustrate my invention, I make use of a conventional tip body 10 such as is employed on Kluge feeders and Kluge automatic platen printing presses. This body is in the nature of a tube having lateral extensions 12 between which the actuating bar 14 is positioned and retained therein by a spring pressure plate 16 mounted to the extensions by screws 18.

One end of the body 10 is detachably connected with a suction hose 20 which may be connected with a vacuum pump or equivalent device. The

opposite end of the body 10 terminates in a hollow head 22 having a threaded exterior 24 on which the tip is mounted. The construction so far described is old and well known in the art.

My invention resides in the metallic tip 26 which includes a threaded bore 28 having threaded relation with the head 24. I provide the tip 26 with a smaller bore 30 which leaves a shoulder 32 on which a resilient gasket 34 is positioned. This gasket includes an opening 36 and a tubular extension 38 which extends into the bore 40 in the head 22.

The lower end of the tip 26 is slightly concave at 42 and is provided with an opening 44 which establishes communication with the suction tube 20 so that the suction may be effective for lifting one sheet at a time off the supply 46 when the tip is brought into operating proximity with the upper sheet. The concavity 42 terminates slightly short of the outer diameter of the tip 26 so as to provide a slight flange 48. I have attained good results with a metallic tip of seven-eighths inch in outside diameter. Fig. 2 illustrates the tip slightly enlarged for the sake of clearness.

In operation, the metallic tip is capable of handling all types of papers up to four ply grade. The tip is capable of resisting wear indefinitely and eliminates the necessity of frequent substitutions of new tips. Because of the concavity 42, an effective suction action is attained on the paper. I have found that the suction area is substantially coextensive with the area of the concavity, while the slight degree of concavity provides a backing for thin paper which prevents such paper from being sucked into the tip, distorted, or otherwise damaged. In feeding relatively thin paper, the area of the opening 44 is sufficient for holding purposes, but in feeding stiffer paper, the suction area is effective throughout the area of the concavity 42.

The structure so far described is substantially identical with that disclosed in the above-identified co-pending application. To facilitate handling of relatively heavy material I provide the tip 26 with a flexible tip 50 which may comprise rubber. The tip 50 is tubular and includes a bead 52 arranged to lie within a groove 54 formed in the outer surface of the tip 26. Fig. 4 illustrates the tip 50 as projecting slightly beyond the lower end of the metallic tip 26 with the tip 50 closely embracing the slightly tapered outer surface 56 of the tip 26. With the tip 50 adjusted according to Fig. 4 an effective air seal is attained when operating on heavy material, as indicated in Fig. 2. As the tip 26 is pressed against

the upper sheet of the supply 46, the tip 50 tends to bend outwardly, which flexing of the tip establishes pressure relation between the tip and the sheet being lifted so as to establish an effective seal for lifting purposes. Because of the suction effective on the sheet being lifted, the sheet is held in contact with the metallic tip. Because of such contact, further distortion of the flexible tip is prevented so that the metallic tip cooperates with the flexible tip for load carrying purposes.

Since the sheet being carried by the tip structure is maintained in pressure relation with the part 26, the flexible tip 50 serves largely as an air sealing adjunct. Such pressure relation between the sheet and the metallic tip lends an element of sturdiness to the flexible tip to a degree which prevents flexing of the tip during the pick up, carrying and placement action of the tip structure so that precise positioning of the sheet is attained. Under all conditions of service the metallic tip cooperates with the flexible tip in such a manner as to balance its flexible character after holding relation has been established between the tip structure and the sheet being handled.

In handling material which does not require a flexible tip, the tip 50 is pulled back upon the metallic tip 26 to the position of Fig. 5. In this position, the greater part of the flexible tip 50 embraces the knurled area 58 on the metallic tip 26. The knurled surface provides an effective grip for connecting and disconnecting the metallic tip. The bead 52 not only reinforces the end of the flexible tip 50 but facilitates reversal of the tip. In reversing the tip its end 60 is folded back upon the tip and the end pulled upwardly to the

position of Fig. 5. When so positioned, the metallic tip 26 operates completely independently of the flexible tip.

In Fig. 6, I illustrate a metallic tip 62 identical in every respect with the tip 26 with the exception that two grooves 54 are provided. After the flexible tip has become worn, the tip may be lowered to position the bead 52 within the lower recess 54 and the worn end of the tip cut off.

Without further elaboration, the foregoing will so fully explain my invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. The combination with a metallic suction tip 15 having a depressed sheet engaging surface, of a tubular resilient element embracing the metallic suction tip and having one end projecting beyond the depressed face, said metallic suction tip being provided with a groove, and a bead carried by 20 the resilient tubular element and lying within said groove, to constitute a pivotal connection between the tube and the tip, said tube being movable to an inoperative position with respect to the depressed face.

2. A suction tip comprising a rigid body having 25 a sheet engaging face, a resilient tubular element embracing said rigid body and having one end projecting beyond the sheet engaging face, said body being provided with a plurality of grooves 30 and a bead carried by the tubular element and normally lying within one of said grooves, said tubular element being shiftable on the body for positioning the bead in the other of said grooves, to compensate wear.

HARRY BEDFORD ALLEN. 25