Oct. 27, 1936. S. W. HENRY 2,058,979

SUCTION FEED DEVICE FOR SHEET MATERIAL

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Fig. 1.

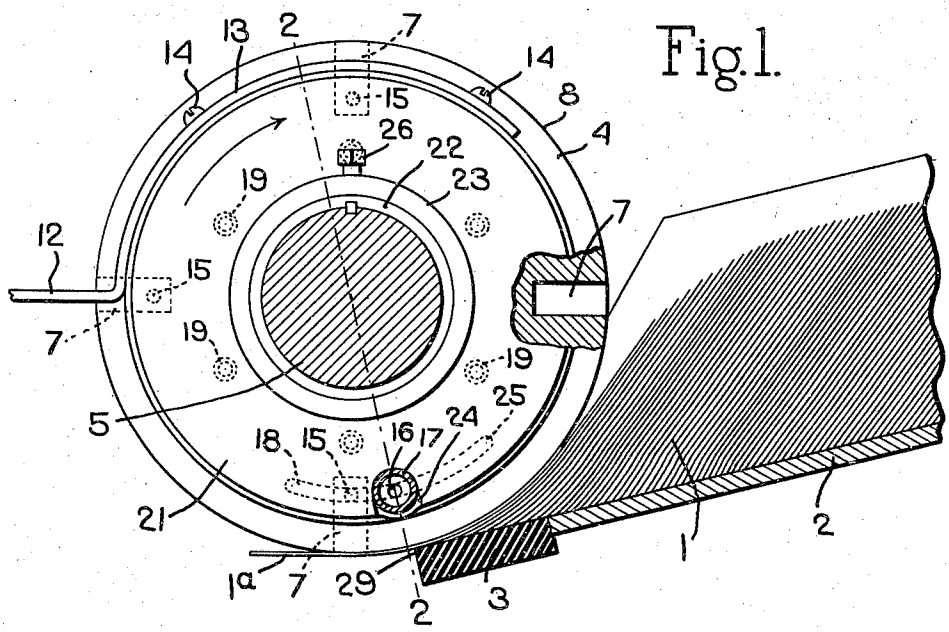
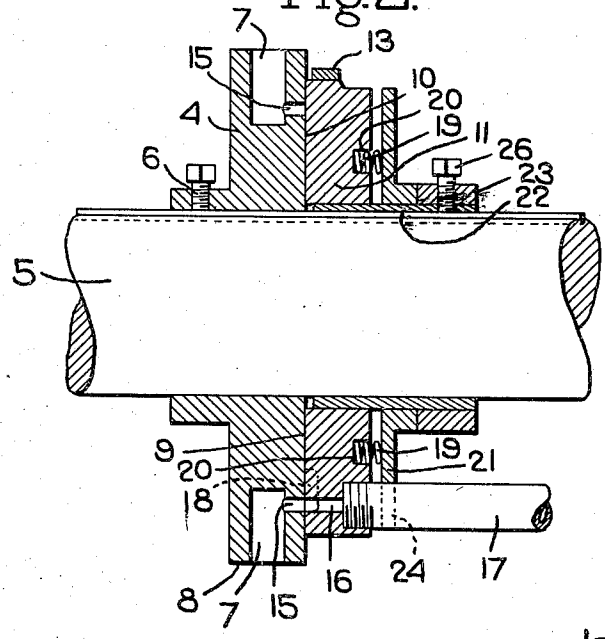


Fig. 2.



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SUCTION FEED DEVICE FOR SHEET MATERIAL

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3 Claims. (Cl. 271—27)

This invention relates to a suction feed device for feeding individual sheets from a stack or pile of sheets and it has for its general object to provide improvements in sheet feeding material of this type such as will be more fully hereinafter set forth.

In order to give an understanding of the invention I have illustrated in the drawing a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

In the drawing:

Fig. 1 is a fragmentary view partially in section showing a sheet feeding device embodying my invention.

Fig. 2 is a section on the line 2—2, Fig. 1, but showing the suction member in an angular position with one of its ports in alignment with the suction pipe.

A device embodying my invention is adapted for feeding various kinds of sheet material intended to be used for various purposes. In Fig. 1 the sheets to be fed singly are indicated at 1, said sheets being arranged in pile or stack form and being contained in a suitable magazine 2. At the delivery end said magazine is formed with a delivery bed 3 of rubber with which the sheets near the delivery end of the stack or pile contact and over which the end sheet 1a is delivered. For delivering the sheets singly there is provided a rotary suction member 4 which is shown as mounted on a rotary supporting shaft 5, said member 4 being held to the shaft through the medium of a set screw 6 or any other suitable device. This rotary suction member 4 is provided with a plurality of suction pockets 7 in its peripheral portion, each suction pocket 7 being open at the periphery of the suction member. This suction member is supported so that its peripheral face 8 having the suction pockets 7 therein is situated in close proximity to the delivery edge 9 of the bed 3, there being just sufficient space between the peripheral face 8 and the bed 3 to permit a single sheet 1 to pass through. The suction member 4 is provided with a flat side face 9 which engages and fits closely against the flat face 10 of a stationary valve member 11 which surrounds the shaft 5. This valve member 11 is shown in the form of a disk and as being secured to a supporting arm or brace 12 which has a portion 13 partially encircling the valve member 11 and secured thereto by screws 14.

Each suction pocket 7 of the suction member 4 is provided with a side port 15 which opens through the flat face 9 of the suction member, said ports normally being closed by the stationary valve member 11. This stationary valve member has a suction port 16 extending laterally therethrough, which port communicates with a suction pipe 17 that is scew-threaded to the valve member 11 and leads to any suitable suction apparatus. The valve member 11 is formed on its inner face 10 with a groove 18 which communicates with the suction port 16, said groove being so situated that the ports 15 are brought into register therewith as the suction member 4 rotates.

The valve member 11 is acted on by suitable springs 19 which function to hold the face 10 of the valve member tightly against the face 9 of the suction member. These springs are shown as coiled springs which are retained in spring-receiving pockets 20 formed in the valve member and said springs are backed by a stationary plate 21 which is mounted on a sleeve 22 secured to the shaft 5. Said sleeve 22 is also provided with a collar 23 which forms a backing for the plate 21. The plate 21 is formed with a notch or opening 24 through which the pipe 17 extends and said pipe thus serves to hold the plate from rotative movement. In the operation of the device a pile or stack of sheets 1 is subjected to a force tending to move them toward the delivery end of the magazine. Such force may be a spring or its equivalent acting on the rear end of the stack of sheets or may be the force of gravity which may be made use of if the magazine has a sufficient inclination and the delivery end is at the lower end thereof. The end sheet 1 is thus normally resting against the peripheral face 8 of the suction member.

The suction member is rotating in the direction of the arrow in Fig. 1 and the length and position of the groove 18 is such that when any port 15 comes into register with the end 25 of the groove the open end of the corresponding suction pocket 7 is in that portion of the periphery of the suction member which rests against the end sheet of the stack. As soon as any port 15 does thus register with the groove 18 the suction apparatus will create vacuum conditions in the corresponding pocket 7 with the result that the end sheet will be held to the periphery of the suction member by the suction thus created. As the suction member continues to rotate this end sheet will be withdrawn from the stack of sheets and carried between the suction member and the bed 3 as shown by the sheet 1a in Fig. 1 and will thus be delivered from the magazine. The other sheets which are adjacent the sheet 1a being

delivered will be held against movement by their contact with the rubber bed 3 so that the movement of the sheet being delivered will not drag with it an adjacent sheet. The pockets 7 will preferably be spaced from each other a proper distance so that the sheet which is being carried along by the suction created in one pocket, such, for instance, as the sheet 1a, will be delivered from the machine before the next pocket arrives in a position to pick up its sheet. It will be noted that the upper face of the rubber bed 3 is in the same plane as the bottom of the magazine 2 and is substantially tangent to the periphery of the suction member 4. Furthermore, the front or delivery edge 29 of the bed member is located at approximately the position where the upper surface of said bed member comes tangent to the suction member.

The apparatus herein shown is simple in construction and effective in operation.

I claim.

1. A suction feed apparatus for sheet material comprising a rotary shaft, a rotary suction member mounted thereon and provided in its periphery with a plurality of suction pockets, such suction member having a flat side face and further having a port communicating with each pocket and opening through said flat face, a stationary valve member through which the shaft extends and having a flat face engaging the flat face of the suction member and normally closing said ports, said valve member having a suction port with which the ports in the suction member successively register as said member rotates, means connecting the suction port to a suction device, a sleeve fast on the shaft, a collar fast to the sleeve, a non-rotatable backing plate loosely mounted on said sleeve and engaging the collar and springs interposed between the backing plate and the valve member for holding the flat face of the valve member against the flat face of the suction member.

2. A device of the class described comprising an open-ended magazine for holding a stack of sheets to be fed, said magazine having a bed of rubber at its delivery end, a rotary suction member situated with its periphery closely adjacent said bed and provided in its periphery with a plurality of suction pockets, the upper face of the bed of rubber being in the plane of the bottom of the magazine and having a tangential relation to the rotary suction member, means to rotate said suction member to bring the pockets successively into register with the end sheet of the stack and means to apply suction to each pocket when it is thus in register whereby the suction in each pocket will withdraw the end sheet from the stack, the frictional engagement of the sheets adjacent the end sheet with the rubber bed preventing said sheets from being withdrawn from the stack by the end sheet when it is delivered.

3. A suction feed apparatus for sheet material comprising a rotary shaft, a rotary suction member mounted thereon and provided in its periphery with a plurality of suction pockets, said suction member having a flat side face and further having a port communicating with each pocket and opening through said flat face, a stationary valve member through which the shaft extends and having a flat face engaging the flat face of the suction member and normally closing said ports, said valve member having a suction port with which the ports in the suction member successively register as said member rotates, a suction pipe connecting the suction port to a suction device, a sleeve fast on the shaft, a collar fast to the sleeve, a non-rotatable backing plate loosely mounted on said sleeve and engaging the collar and having an opening through which the suction pipe extends, and springs interposed between the backing plate and the valve member for holding the flat face of the valve member against the face of the suction member.

SHALA W. HENRY.