

March 26, 1929.

A. BROADMEYER

1,707,209

SUCTION FEED ROLLER

Original Filed Nov. 19, 1926

Fig. 1.

Fig. 4.

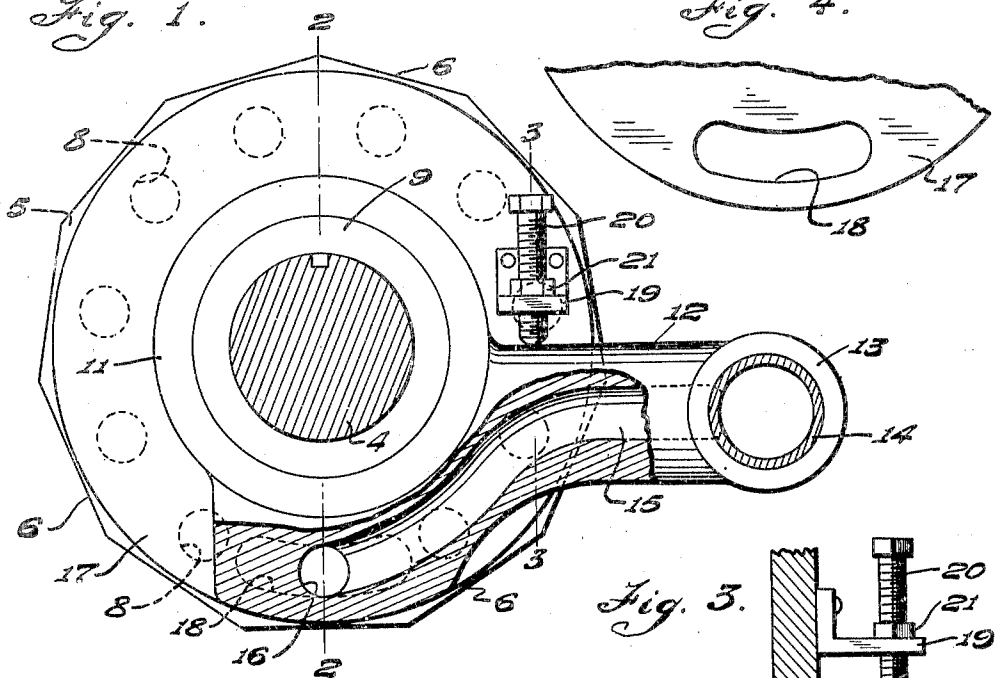


Fig. 3.

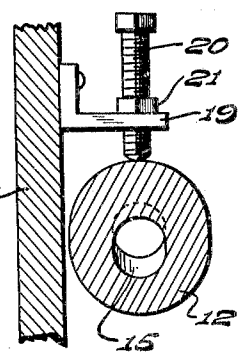
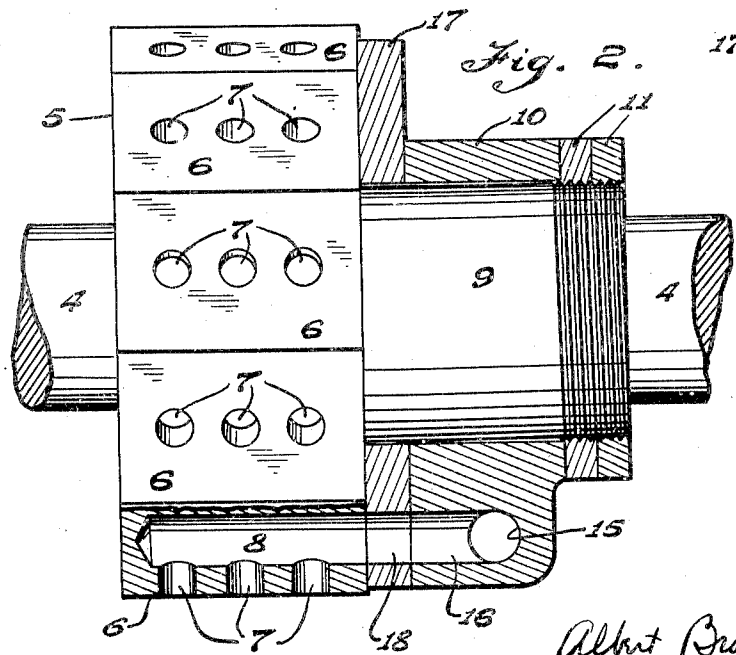


Fig. 2.

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By

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UNITED STATES PATENT OFFICE.

ALBERT BROADMEYER, OF HARRISBURG, PENNSYLVANIA, ASSIGNOR TO THE W. O. HICKOK MFG. CO., OF HARRISBURG, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

SUCTION-FEED ROLLER.

Original application filed November 19, 1926, Serial No. 149,471. Divided and this application filed March 3, 1928. Serial No. 258,959.

The present invention relates to suction rollers that are utilizable for a large number of purposes, but are peculiarly effective for feeding or acting upon sheets of paper.

5 One of the objects of the present invention is to provide an improved mechanism that is peculiarly effective for feeding relatively thick sheets, such as cardboard which will not give or bend with the usual curved peripheral surface of the roller. The structure, however, is entirely practical for the feeding of light or thin sheets as well, and creates a peculiar breaking action in separating the sheet being moved from an underlying sheet.

15 The present application is a division of application, Serial No. 149,471, filed Nov. 19, 1926.

In the accompanying drawings:

20 Figure 1 is an end elevation of the roller, Figure 2 is a view partly in elevation and partly in section on the line 2—2 of Figure 1,

25 Figure 3 is a detail sectional view on the line 3—3 of Figure 1,

Figure 4 is a detail face view of the portion of the disk having the slot.

In the embodiment disclosed, a drive shaft 4 is provided, on which is slidably keyed the suction roller, comprising a rotary body 5 that has its peripheral face formed with a series of angularly disposed flat sections or portions 6. Opening through these flat faces are suction ports 7 that communicate with 35 longitudinally disposed passageways 8, which in turn open through one end of the body 5.

40 Said body has at said end an outstanding hub 9 that rotates with the body and passes through a collar 10. The collar and hub are held against detachment by lock nuts 11 threaded on the hub and abutting against the collar. The said collar is formed with a neck 12 provided with a sleeve 13 surrounding a suction tube 14 and said neck has a suction conduit 15 that terminates in a port 16 opening through the inner end of the collar 10 and in line with the open ends of the passageway 8. It will be understood that the

conduit 14 is connected to the intake end of 50 any suction device, such as a pump, and for an example of the mounting thereof and the connections, attention may be called to my prior Patent, No. 1,494,303, granted me May 13, 1924.

55 Interposed between said collar 10 and the adjacent end face of the body 5 is a disk 17 that covers the open ends of the passageways 8. Said disk is, however, provided with a curved slot 18 that affords communication 60 between said ends of the passageways 8 and the suction port 16. As the roller revolves, the disk 17 is held against rotation with the suction roller. To this end it is provided with an ear 19 through which is threaded an adjusting screw 20 that bears on the neck 12. A lock nut 21 serves to hold the screw in its adjusted position.

70 With this construction it will be evident that when the roller is rotated, the open ends of the passageways 8 will be successively brought into communication through the slot 18 with the suction port 16, and if suction is created in the passageway 15, obviously there will be successive indrafts of air 75 through the sets of ports 7 opening through the flat faces 6. If then the active ports 7 are associated with sheets of paper, the paper will close said ports and be moved by their adherence to the rotating suction roller body. 80 As the face portions or sections 6 are flat, a relatively broad bearing surface is presented to the sheet being carried, and a substantially air-tight joint is secured that is not obtainable where the ports open through the 85 rounded face of a truly cylindrical body. While this makes the structure peculiarly desirable for heavy sheets and cardboard, it has an advantageous action with sheets of any kind, for as the flat face carrying the 90 sheet begins to move upwardly or in an angular direction to its point of original contact the relatively sharp straight corner at its rear end will cause a longitudinal pucker in the sheet that will break said sheet away from 95 the underlying sheet and thus better insure their separation so that the usual air blast can find access to a space between the sheets.

This avoids to a material degree the danger of two sheets being carried along together. By turning the disk 17 through the medium of the adjusting screw 20, the position of the ends of the slot 18 can be varied thereby advancing or retarding the point at which suction begins.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the herein described invention.

What I claim as new, is:

1. In sheet feeding mechanism, a rotatable head provided with a relatively fixed substantially continuous peripheral face having a substantially flat portion, an air intake port opening through said flat portion, and means for creating suction through said port at one point to cause a portion only of a sheet to adhere to said flat portion and cutting off such suction when said portion has made less than a quarter turn to bend the sheet about the rear end of said flat portion and then release it to permit it to move in a substantially tangential path away from the head.

2. In sheet feeding mechanism, a rotatable head provided with a substantially continuous peripheral roller face having a substantially flat portion with a substantially straight breaking edge across the peripheral face, an air intake port opening through said flat portion, and means for creating suction through said port at one point to cause a portion only of a sheet to adhere to said flat portion and cutting off such suction when said portion has made less than a quarter turn to bend the sheet about the rear straight breaking edge of said flat portion and then release it to permit it to move in a substantially tangential path away from the head.

3. In sheet feeding mechanism, a rotatable head provided with a relatively fixed substantially continuous peripheral face having a plurality of flattened portions, air intake ports opening through said flattened portions, and means for causing suction successively through said ports as they successively reach a predetermined position upon the rotation of the head to cause portions of sheets to adhere to said flattened portions and cutting off said suction when said portions have made less than a quarter turn to bend the sheets around the rear ends of said flattened portions and then release them to permit them to move in a path generally tangential to the head.

4. In sheet feeding mechanism, a rotatable head provided with a relatively fixed peripheral

face having a substantially flat portion, an air intake port opening through said portion and through one end of the head, and a suction conduit having a mouth traversed by said end of the head and having the intake port thereby moving into communication with the conduit at one point upon the rotation of the head to attach a portion of a sheet to the flat portion, said intake port moving out of communication with the mouth after the flat portion has moved to an angular position less than a quarter turn to first bend the sheet and break it from an underlying sheet and then permit it to move edgewise away from the head in a substantially tangential path.

5. In sheet feeding mechanism, a rotatable head provided with a relatively fixed peripheral face having a plurality of flat portions, intake ports opening through said portions and through one end of the head, and a suction conduit having a mouth traversed by said end of the head and having the intake ports thereby moving successively into communication with the conduit at one point upon the rotation of the head to attach sheets thereto and causing them to bend about the rear edges of said flat portions, said intake ports successively moving out of communication with the mouth after said bending operation to cut off the suction and cause the edgewise movement of the sheets in a substantially tangential path away from the head.

6. In sheet feeding mechanism, a rotatable head provided with a peripheral sheet engaging face, said face comprising a series of successive substantially flat angularly disposed portions forming transverse ridges at their adjacent ends, air intake ports opening through said faces, and means for creating suction successively through the ports as they reach a predetermined position during the rotation of the head to attach portions of sheets flat against said flat portions and hold them until said sheets have been bent around said transverse ridges and after such bending operation, cutting off the suction successively through the ports to cause said head to move the sheets edgewise away from the head.

7. In sheet feeding mechanism, a rotatable head provided with a peripheral sheet engaging face, said face comprising a successive series of substantially flat angularly disposed portions having meeting ends that form a plurality of breaking ridges or ribs across the peripheral face, air intake ports opening through said faces, and means for creating suction successively through the ports as they reach a predetermined position during the rotation of the head.

8. In a sheet feeding mechanism, a rotatable head provided with a peripheral sheet engaging face provided with relatively fixed outstanding transversely disposed breaking

ridges or ribs, air intake ports opening through the periphery between the said ridges or ribs, and means for creating suction successively through the ports as they reach a predetermined position during the rotation of the head to attach portions of sheets flat against the flat portions, maintain such attachment until the sheets are bent about the ridges and then cutting off the suction to release the sheets and cause their edge-wise movement away from and substantially tangential to the head. 10

In testimony whereof, I affix my signature
ALBERT BROADMEYER.