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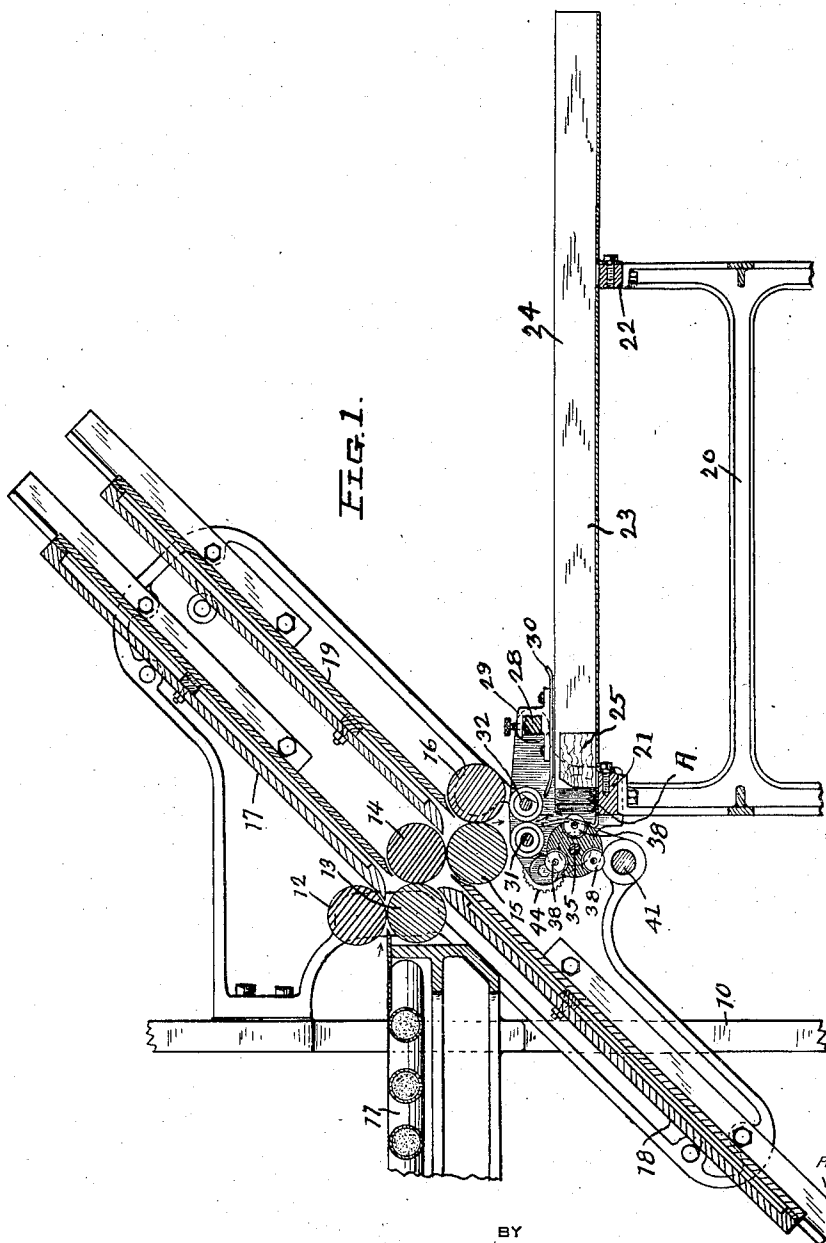
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1,991,028

SHEET STACKER

Filed Nov. 23, 1923

4 Sheets-Sheet 1



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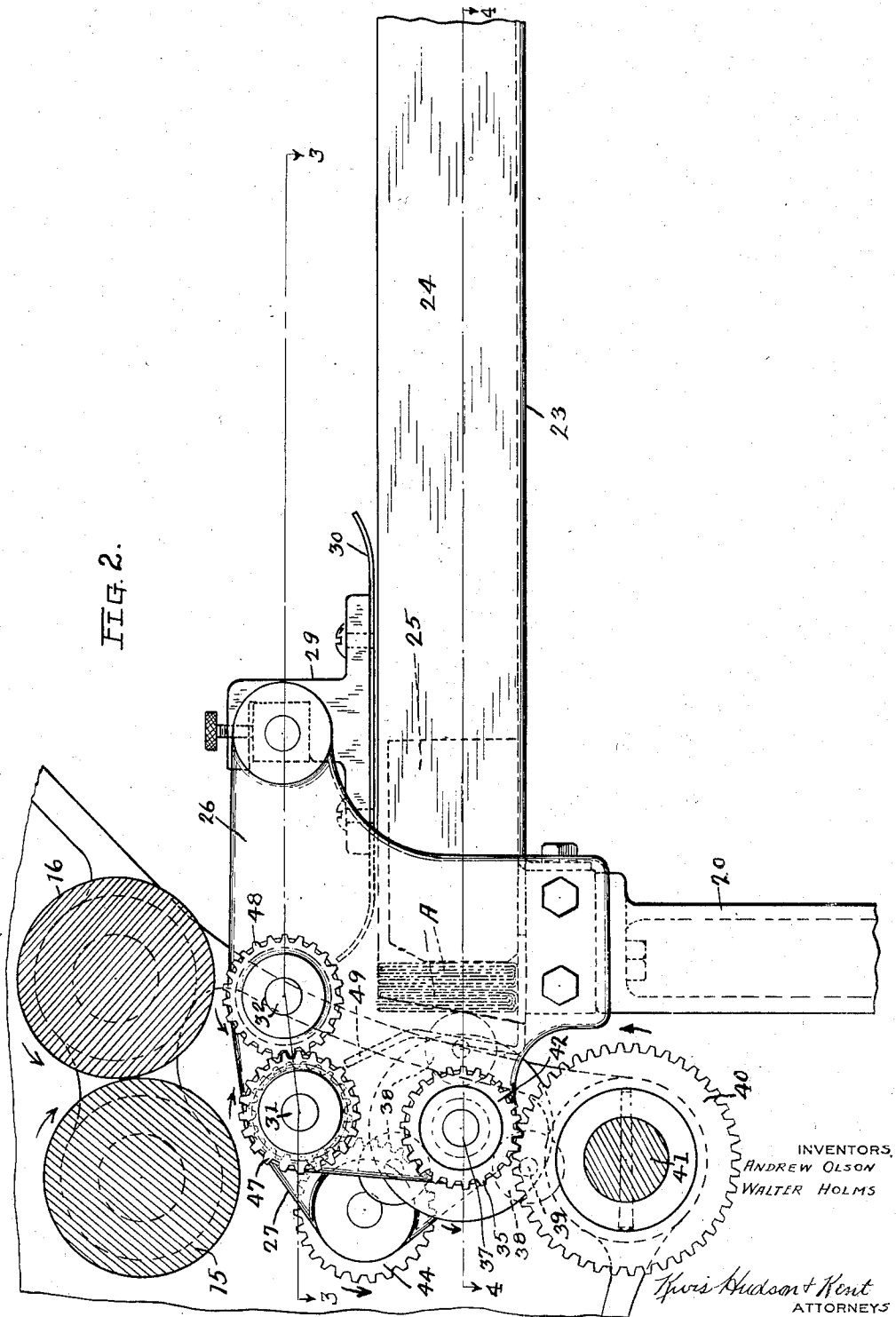
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SHEET STACKER

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4 Sheets-Sheet 2



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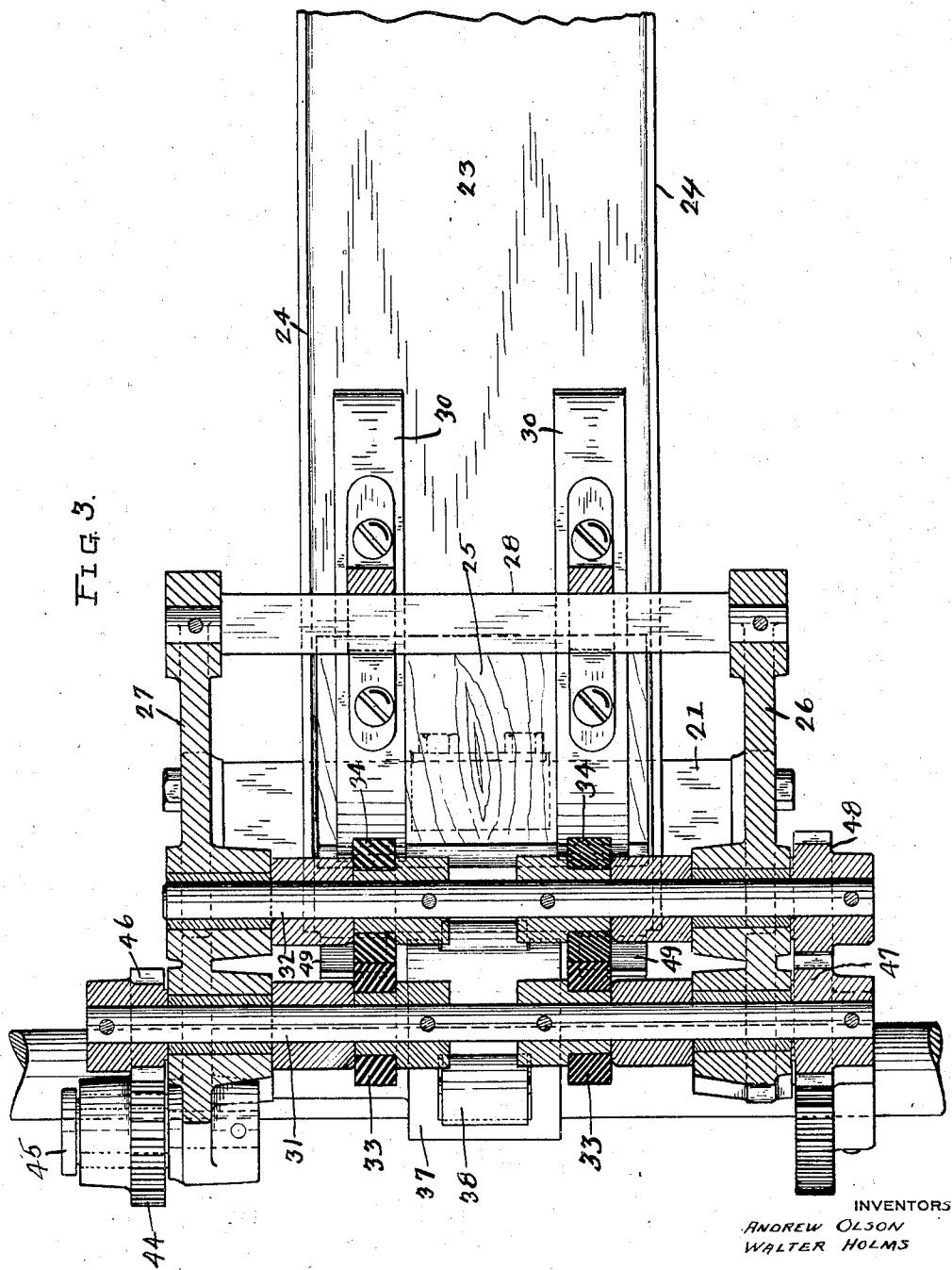
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SHEET STACKER

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4 Sheets-Sheet 3



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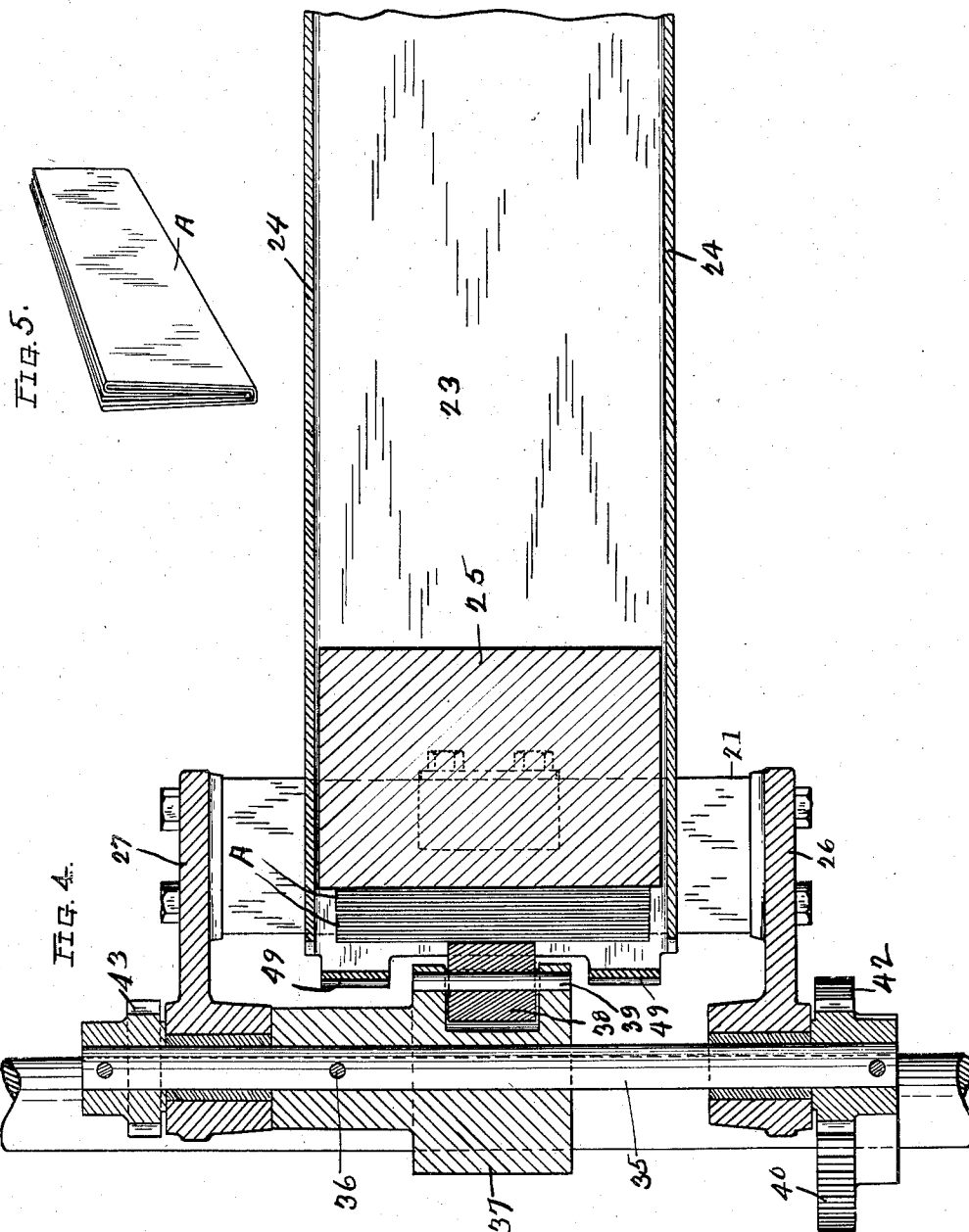
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

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SHEET STACKER

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Application November 23, 1928, Serial No. 321,370

10 Claims. (Cl. 271—87)

This invention relates to improvements in sheet stackers, and is intended primarily for use in the stacking of folded sheets of small size as they are delivered from the folding machine.

The invention finds special utility in connection with folded sheets of a size comparable to that of an ordinary calling card, such sheets being in common use for enclosure in small packages or cartons of merchandise of various kinds. The stacking of folded sheets of such small size has offered considerable difficulty heretofore, ordinary stackers being of little use for the purpose.

One of the objects of the present invention therefore is to provide a stacker capable of satisfactory operation in connection with sheets of small size.

Another object is the provision of means of this character capable of collecting and stacking a large number of sheets at one time.

A further object is the stacking of such sheets in perfect alignment, so that they can be lifted out of the stack and placed in suitable containers without any other hand work whatever.

Other objects and features of novelty will appear as we proceed with the description of that embodiment of the invention which, for the purposes of the present application, we have illustrated in the accompanying drawings, in which:

Figure 1 is a vertical, sectional view illustrating an embodiment of the invention in operative relation with a folding machine,

Fig. 2 is a view, principally in side elevation, showing a portion of the machine on a larger scale,

Fig. 3 is a horizontal sectional view taken substantially on the line 3—3, Fig. 2.

Fig. 4 is a horizontal section taken substantially on the line 4—4, Fig. 2; and

Fig. 5 is a perspective view of a folded sheet such as our invention is adapted to handle.

In Fig. 1 of the drawings we have illustrated a fragment of a folding machine of the buckle fold type comprising a frame member 10, a feed table 11, feeding and folding rolls 12, 13, 14, 15 and 16, and fold sections 17, 18, and 19. The folded sheets, as they leave the folding machine, are directed downwardly by the rolls 15 and 16.

The stacker is mounted upon a movable frame 20, which may be positioned adjacent the folding machine at times when its use is required in connection with that machine. The frame 20 includes a pair of cross members 21 and 22, upon which is supported a sheet metal table 23 having side rails 24 constituting a long flat

bottomed trough. In this trough a block 25, preferably of wood, is adapted to slide, being guided by the rails 24.

Brackets 26 and 27 are attached to the front and rear ends respectively of the cross member 21. These brackets are connected at their forward ends by a square bar 28, upon which are adjustably secured a pair of clamps 29 which support horizontal guide fingers 30, under which the folded sheets run in the operation of the stacker. The rear ends of these guides are deflected upwardly as shown in order to guard against the possibility of their catching into paper extending above the normal level of the stack, due to inaccurately folded sheets or other causes.

In the brackets 26 and 27 we provide bearings in which are rotatably supported shafts 31 and 32 carrying rubber discs 33 and 34 respectively, these shafts and discs constituting feed rolls to which the folded sheets are delivered by the rolls 15 and 16 of the folding machine.

Below the shaft 31 and a little to the rear thereof the brackets 26 and 27 have bearings in which is rotatably mounted a shaft 35. Upon this shaft 35 we secure, by means of a pin 36 or otherwise, the hub of a pusher wheel 37 provided with a plurality of projections, adapted to engage one after another the folded sheets as they are added to the stack. These projections preferably take the form of anti-friction rollers 38 mounted upon spindles 39 set into the wheel, recesses being provided in the periphery of the wheel to accommodate the greater portions of the rollers 38.

It is desirable to take power for the operation of the stacker from the folding machine with which it is used, and to this end we may utilize a gear 40 carried upon a shaft 41 of the folding machine, this shaft being driven from some convenient moving part of the folding machine. On the forward end of shaft 35 we mount a pinion 42 which meshes with the gear 40. On the rear end of this shaft 35 is another pinion 43 which meshes with an idler 44 on a stub shaft 45 mounted in the bracket 27. The idler 44 in turn meshes with a pinion 46 on the rear end of the shaft 31, and the shafts 31 and 32 are interconnected by intermeshing pinions 47 and 48 on the forward ends thereof. The directions of rotation of the various shafts are indicated by arrows in Fig. 2, it being noted that the wheel 37 rotates clockwise, as viewed in that figure and that the side of the wheel facing the table 23 therefore moves downwardly.

The rear end of the sheet metal table 23 is provided with extensions in the form of spaced upturned guide fingers 49. The wheel 37 and its rollers 38 extend into the space between these 5 fingers.

In the operation of the machine, folded sheets are delivered from the rolls 15 and 16 of the folding machine into the feed rolls of shafts 31 and 32. These latter rolls feed the sheets downwardly, and the fingers 49, which may be inclined slightly as illustrated, guide the sheets 10 in their downward travel into position in front of the wheel 37 and behind the last delivered sheet of the stack. Immediately thereafter one 15 of the rollers 38 comes into contact with the sheet and, by virtue of its movement in a downward and forward direction, imparts to the sheet a push in a downward and forward direction which causes the sheet to travel downwardly until it rests upon the table 23, and to move 20 forwardly a short distance carrying with it in the latter movement all of the sheets in the stack, and imparting to the wooden block 25 a corresponding forward movement.

Owing to the fact that we provide a plurality of rollers 38 in the wheel 37, and owing to the fact that the latter rotates at approximately the same speed as the shafts 31 and 32, it is impossible for the feed rolls of the latter shafts to 30 deliver sheets so fast that any of them fail to receive at least one push from the rollers 38. In fact each sheet receives two or more such pushes. Furthermore, the rollers 38, owing to the comparatively large diameter of the wheel 37, have 35 a greater surface speed than the speed of delivery of the sheets by the rubber discs 33 and 34. Consequently, even though a roller 38 may be directly below a sheet delivered by discs 33 and 34, there will be no impact of the sheet upon that roller, and on the contrary, the roller will 40 move away from the sheet.

As the stack of sheets moves forward the guide fingers 30 hold the sheets down and serve to even up any small inequalities which may occur 45 in the stack. The folded sheets A are illustrated in Figs. 1, 2 and 4 of the drawings in stacked position. In practice, the trough-shaped table is permitted to become filled for some distance before a portion of the sheets is removed. 50 When this is done the block 25 is at once slid rearwardly to engage with the foremost remaining sheet, and thus to maintain all of the remaining sheets in upright position.

While we have herein disclosed more or less 55 in detail one of the preferred embodiments of the invention, we desire it to be understood that such detail disclosure is primarily for the purpose of fully illustrating the invention and is not to be construed as constituting a limitation 60 upon the scope of the invention.

Having thus described our invention, we claim:

1. In a stacker for paper handling machines, a table, means for delivering folded sheets downwardly onto said table in upright position one 65 behind another, whereby a stack is formed, and means for pushing said sheets forwardly step by step comprising a pusher wheel situated behind the point of delivery of said sheets, said wheel 70 having a plurality of projections thereon adapted to engage the sheet last delivered, and means for rotating downwardly the side of said wheel which faces the sheets at a surface speed greater than the speed of delivery of said sheets.

2. In a stacker for paper handling machines,

a table, means for delivering folded sheets downwardly onto said table in upright position one behind another, whereby a stack is formed, means for pushing said sheets forwardly step 5 by step, comprising a pusher wheel situated behind the point of delivery of said sheets, said wheel having a plurality of anti-friction rollers partially projecting beyond its periphery and adapted to engage the sheet last delivered, and means for rotating downwardly the side of said 10 wheel which faces the sheets at a surface speed greater than the speed of delivery of said sheets.

3. A stacker unit movable to a position adjacent a paper handling machine and comprising a receptacle provided above the same with rollers 15 for feeding sheets downwardly therein from the machine, means below the rollers for seating the sheets on edge in the receptacle and packing them in standing position therein one behind another, and mechanism for imparting motion 20 to said rollers and said means and operated by a part of the machine when said unit is moved to said position.

4. A stacker unit movable to a position adjacent a paper handling machine and comprising 25 a receptacle for receiving sheets from the machine, a pair of rollers journaled on the unit above the receptacle thereof and adapted to feed sheets downwardly into said receptacle from said machine, a rotatable device mounted on the 30 unit below the rollers and adapted to seat the sheets on edge in the receptacle and pack them in standing position therein one behind another, and gearing for driving said rollers and said device 35 and driven by a part of the machine when said unit is moved to said position.

5. A stacker unit movable to a position adjacent a paper handling machine and comprising 40 a receptacle for receiving sheets from the machine, a pair of rollers journaled on the unit above the receptacle thereof and adapted to feed sheets downwardly into said receptacle from said machine, an annular member provided circumferentially thereof with spaced sheet engaging 45 elements projecting therefrom, said member being journaled on the unit below said rollers and said elements being adapted to seat the sheets on edge in the receptacle and pack them in standing position therein one behind another, 50 and means for driving the annular member and said rollers and driven by a part of the machine when the unit is moved to said position.

6. A stacker unit movable to a position adjacent a paper handling machine and comprising 55 a receptacle for receiving sheets from the machine, a pair of rollers journaled on the unit above the receptacle thereof and adapted to feed the sheets downwardly into said receptacle from said machine, a rotatable device mounted on the unit below the rollers thereof 60 and adapted to seat the sheets on edge in the receptacle and pack them in standing position therein one behind another, means on the unit for guiding the sheets from the rollers to the rotatable device, and means for driving said 65 rollers and said device and driven from the machine when said unit is moved to said position.

7. A stacker unit movable to a position adjacent a paper handling machine and comprising 70 a movable support, a horizontal receptacle thereon for receiving sheets from the machine, rollers and a rotatable device arranged in superposed relation adjacent an open end of the receptacle and journaled on said support, said 75 rollers being adapted to feed sheets downwardly

toward said end of the receptacle from said machine and said rotatable device being adapted to push and seat the sheets on edge in said receptacle and pack and advance them therein one behind another, and gearing for driving the rollers and the rotatable device and driven from a part of the machine when said unit is moved to said position.

8. A stacker unit movable to a position adjacent a paper handling machine and comprising a receptacle for receiving sheets from the machine, rollers journaled on the unit above one end of the receptacle thereof and adapted to feed the sheets downwardly therein from said machine, means between which the sheets are packed standing on edge one behind another in the receptacle and comprising a member movable along said receptacle as sheets are fed and packed therein and a device for packing the sheets in said receptacle rearwardly of said member and mounted on said unit below the rollers thereof, and mechanism for imparting motion to said rollers and said device and operated by a part of the machine when the unit is moved to said position.

9. In a movable stacker unit for paper handling machines, a pair of rollers for receiving sheets from a part of the machine when the unit is moved into operative relation therewith, a stacker box having one end disposed below the rollers and into which the sheets are di-

rected downwardly by the latter, means arranged below the rollers and adapted to seat the sheets on edge in the box and pack them along the same in standing position therein one behind another, mechanism for driving the rollers and operating said means, said mechanism being operated by a driven element of the machine when the stacker unit is moved into operative relation therewith, and a movable frame carrying the aforesaid rollers, box, means and mechanism and enabling the same to be moved as a unit into operative relation with said machine.

10. In a movable stacker unit for paper handling machines, a movable support, a packer box thereon, a pair of spaced brackets mounted on the movable support adjacent an open end of the packer box, feed rollers and a rotatable device journaled in superposed relation on said brackets, said rollers being adapted to feed sheets downwardly toward said end of the packer box and said rotatable device being adapted to seat the sheets downwardly on edge in the packer box and pack and advance them in standing position therein one behind another, and gearing for driving said rollers and said device and driven by a part of said machine when said unit is moved into operative relation therewith.

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