Jan. 20, 1953 E. L. JOHNSON 2,626,148

AUTOMATIC SHEET FEEDING MECHANISM

Filed March 3, 1950 4 Sheets-Sheet 1

Fig. 2.

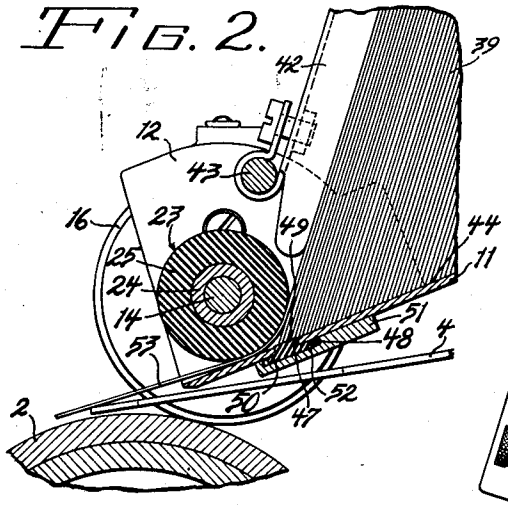


Fig. 1.

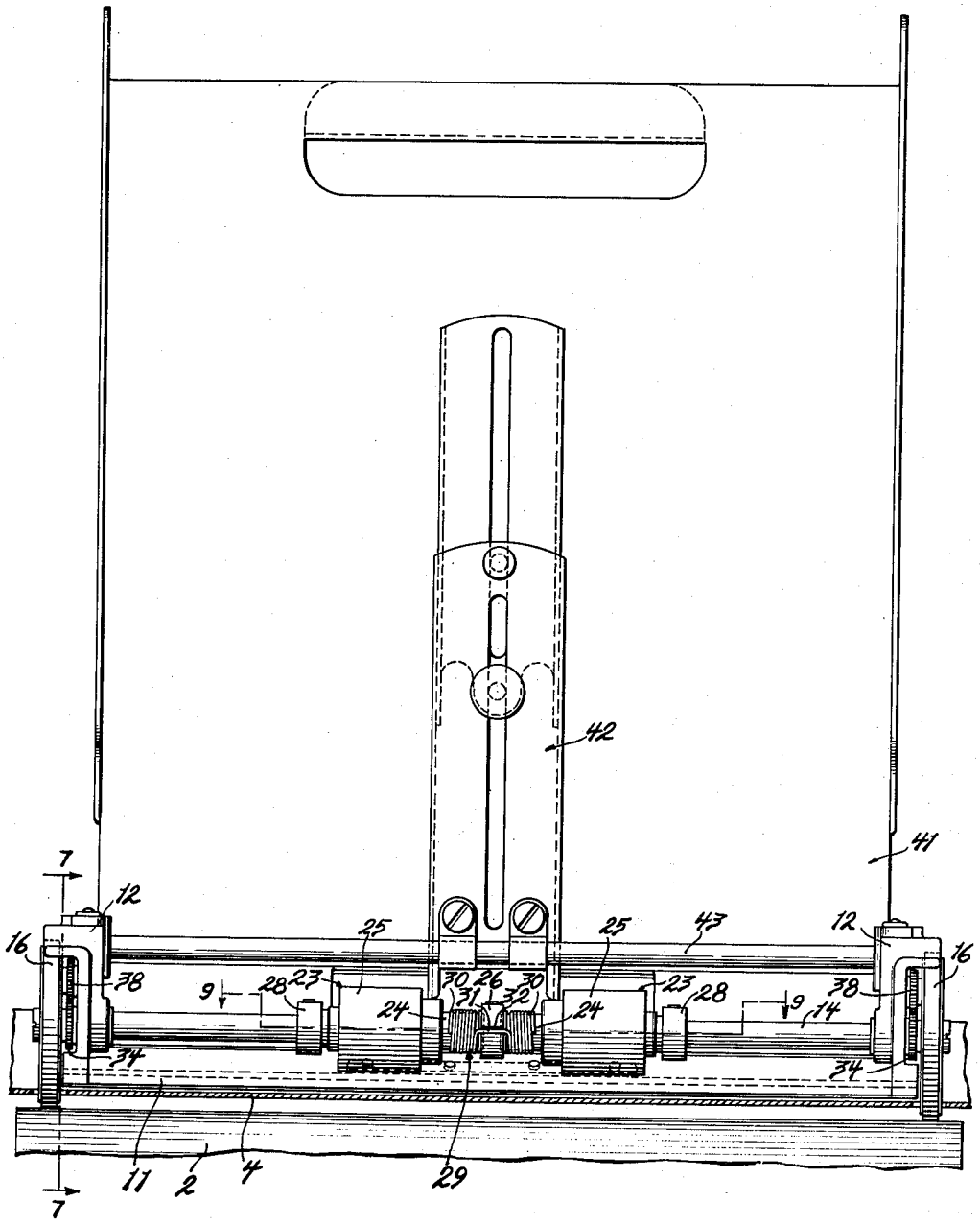
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AUTOMATIC SHEET FEEDING MECHANISM

Filed March 3, 1950 4 Sheets-Sheet 2

FIG. 3.



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AUTOMATIC SHEET FEEDING MECHANISM

Filed March 3, 1950 4 Sheets-Sheet 3

FIG. 4.

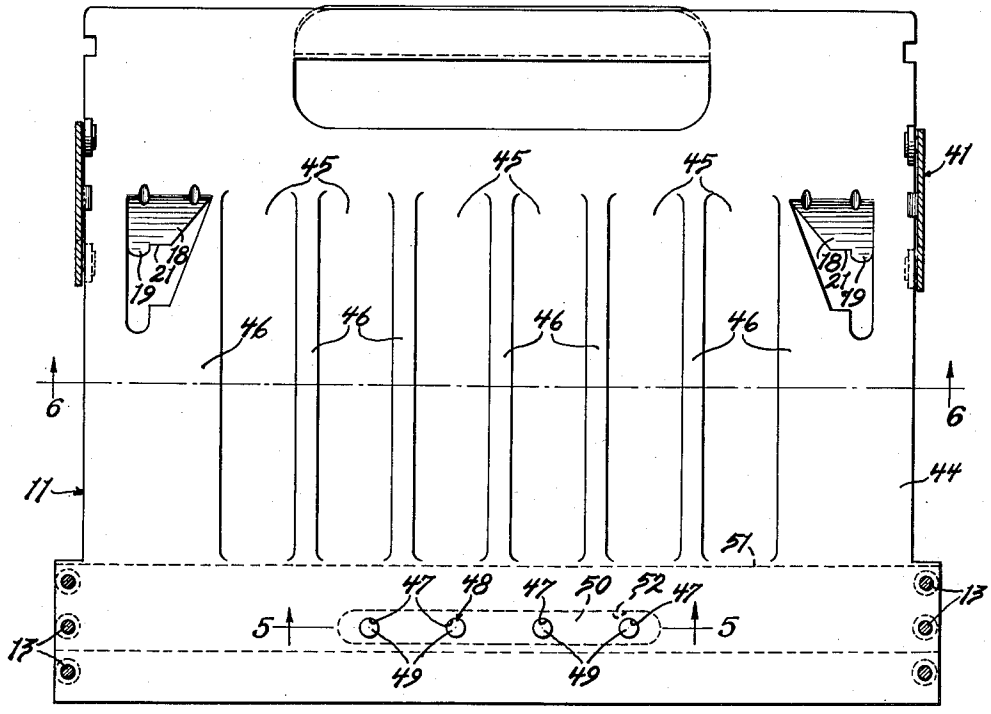


FIG. 5.

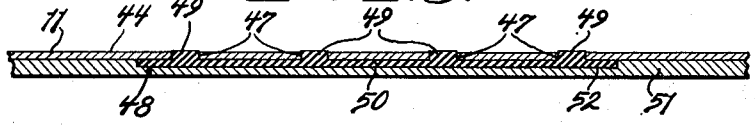
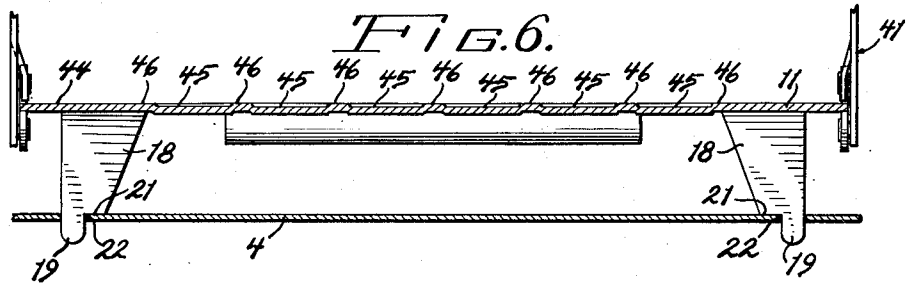


FIG. 6.



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AUTOMATIC SHEET FEEDING MECHANISM

Filed March 3, 1950 4 Sheets-Sheet 4

Fig. 7.

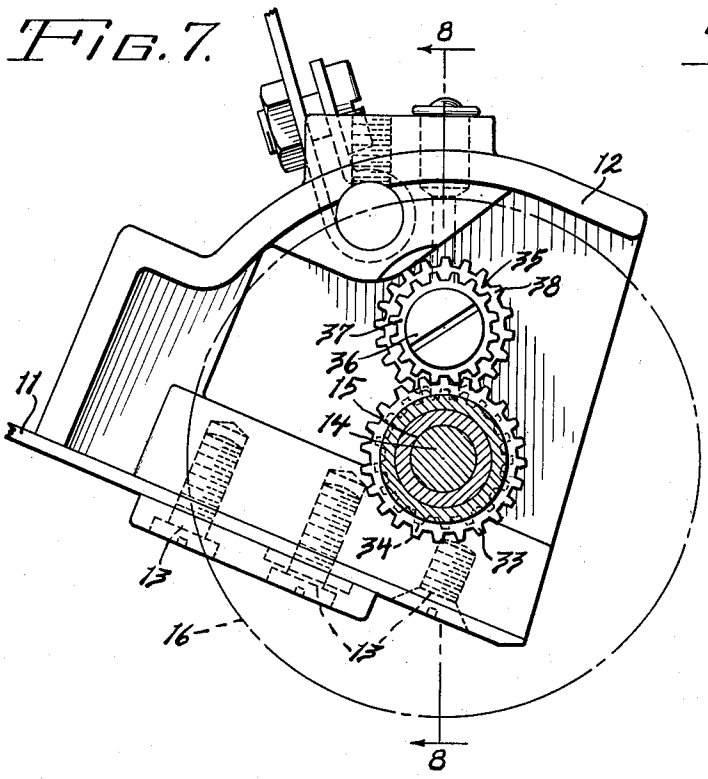


Fig. 8.

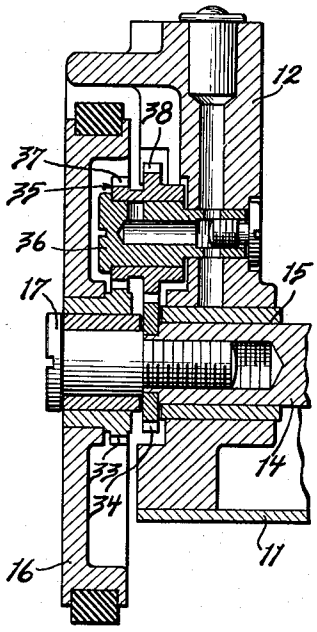
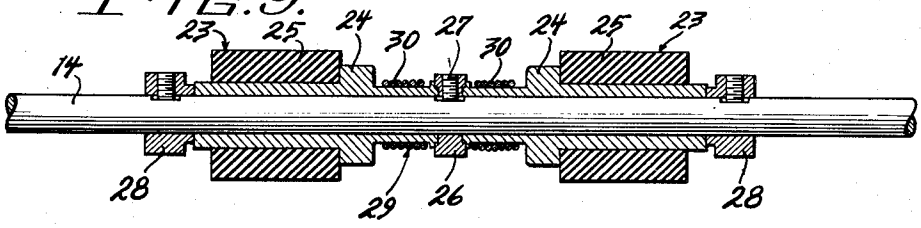


Fig. 9.



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Patented Jan. 20, 1953

2,626,148

UNITED STATES PATENT OFFICE

2,626,148

AUTOMATIC SHEET FEEDING MECHANISM

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Application March 3, 1950, Serial No. 147,498

13 Claims. (Cl. 271—39)

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My invention relates particularly to automatic sheet feeding mechanism for use on a microfilm recorder embodying sheet handling or feeding mechanism provided with a horizontal driven rotatable sheet feed drum to which sheets are sequentially fed, although not limited to this use alone, and more particularly concerns a feeder of the type described and claimed in my United States application for Letters Patent, Serial No. 53,646, filed October 9, 1948, for improvement in Automatic sheet Feeding Mechanism, on which this invention may be considered an improvement.

Objects of the invention reside in the provision of a simple and effective automatic sheet feeding mechanism for sequentially feeding sheets from a stack thereof, which is well adapted for the above use and adapted for installation on a certain currently available microfilm recorder with only minor alteration of the recorder, which provides for the driving of the feed roll or feed device thereof from the feed drum of a sheet handling mechanism, which is conveniently portable, which is readily installed on and removed from a sheet handling machine at will so that sheets may be readily fed to the sheet handling machine either automatically or by hand, which is dependable as to sequentially feeding sheets singly, which provides for making the velocities at which the sheets are fed by the sheet feeding mechanism and by the sheet handling mechanism more nearly equal, which accommodates for differences in sheet speed as control of the sheet velocity passes from the sheet feeding mechanism to the sheet handling mechanism, and which provides for desirably closely spacing the sheets as they are sequentially fed for the instant purpose of conserving film in producing microfilm records by photographing the sheets on the film in closely spaced relation.

The invention will be more readily understood by reference to the accompanying drawings forming a part hereof and in which—

Figure 1 is a partial sectional view of a microfilm recorder on which an automatic feeding mechanism embodying my invention is installed;

Figure 2 is a similar enlarged view;

Figure 3 is a front elevation of the automatic feeding mechanism and showing parts of a microfilm recorder on which it is installed;

Figure 4 is a top plan view of the sheet stack support plate of the automatic feeding mechanism and a part of the feeding mechanism in section;

Figure 5 is a partial section taken substantially on the line 5—5 of Figure 4;

Figure 6 is a sectional view taken substantially

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on the line 6—6 of Figure 4 and showing a part of a microfilm recorder on which the automatic feeding mechanism is installed;

Figure 7 is a partial sectional view taken substantially on the line 7—7 of Figure 3;

Figure 8 is a partial sectional view taken substantially on the line 8—8 of Figure 7; and

Figure 9 is a partial sectional view taken substantially on the line 9—9 of Figure 3.

Referring to the drawing and particularly to Figure 1, the sheet handling machine on which my automatic sheet feeding mechanism is shown to be used, is a microfilm recorder the major portion of which is enclosed within a cabinet including a top 1.

A horizontal rotatable sheet feed drum 2 is disposed within the recorder cabinet immediately below an opening 3 in the cabinet top and a generally horizontal hand sheet feed plate or chute 4, carried on a support 5 arranged in the opening 3, is inclined downwardly toward the upper portion of the feed drum in tangential sheet feeding relation therewith for the sequential hand feeding of sheets to the feed drum.

The feed drum is power driven in a suitable manner and in a counterclockwise direction in Figure 1, and spring urged rotatable pressure rollers 6 engage the feed drum. The sheets, as they are fed to the feed drum, are gripped between the feed drum and rollers 6 and are fed downwardly by the feed drum as it is rotated. As the sheets are fed downwardly from the feed drum, they pass between vertically spaced rotatable feed rollers 7 and spring urged rotatable pressure rollers 8, and the feed rollers 7 being driven in timed relation with the feed drum 2 in a suitable manner, the sheets are fed thereby downwardly past a photographic field 9 where they are photographed, the sheet path being indicated by the dot and dash line 10 in Figure 1.

My automatic sheet feeding mechanism comprises as follows:

A rectangular support plate 11 is provided with upwardly extending projections 12 at opposite sides of the front end thereof, these projections being bearing brackets secured downwardly on the support plate by screws 13, see particularly Figure 7. A rotatable shaft 14 is arranged transversely of and above the support plate and inwardly adjacent said end thereof and extends through and is journaled in the bearing brackets 12 as designated at 15 in Figure 8. Two rotatable drum engaging friction rollers 16, respectively disposed at the sides of the support plate and at the outsides of the bearing brackets 12, are rotatably mounted on opposite ends of the shaft 14 in coaxial relation therewith and

for rotation independently thereof by means of headed and shouldered screw studs 17 screw-threaded into the ends of the shaft 14 in coaxial relation therewith, these rollers being thus arranged on an axis above and inwardly adjacent the front end of the support plate and being of relatively large diameter and projecting below the support plate for rolling driven engagement downwardly on the feed drum 2 as hereinafter described.

Two support legs 18 are spaced transversely of the support plate 11 and are formed integrally therewith and extend downwardly therefrom in the region of the rear end thereof, and the lower end portions 19 of the legs 18 are reduced, see Figure 6, and form shoulders 21. The portion of the hand sheet feed plate 4 remote from the feed drum 2 is provided with transversely spaced apertures 22 downwardly into which the reduced end portions 19 of the legs 18 loosely engage with the shoulders 21 engaged downwardly on the feed plate 4 for positioning the support plate 11 above the feed plate 4 and inclined downwardly toward the upper portion of the feed drum 2 in adjacent tangential sheet feeding relation therewith and with the drum engaging rollers 16 in rolling driven engagement downwardly on the feed drum, see Figure 1.

The support plate 11 forms the base of the automatic feeding mechanism and carries the mechanism thereof including the drum engaging rollers 16 and shaft 14 as a unit, so that the automatic feeding mechanism is conveniently portable and is readily installed on and removed from the sheet handling machine by engaging and disengaging the legs 18 with the apertures 22 with vertical movement of the feeding mechanism.

The loose engagement of the reduced end portions 19 of the legs 18 in the apertures 22 in cooperation with engagement of the shoulders 21 downwardly on the feed plate 4 provides pivotal engagement of the legs 18 downwardly on the feed plate 4 in the region of the other end of the support plate and thus in a region horizontally and radially remote from the end of the support plate 11 at which the drum engaging rollers 16 are disposed to permit vertical movement of the feeding mechanism whereby weight of the feeding mechanism presses the drum engaging rollers 16 downwardly on the drum 2 to provide adequate driving engagement between the feed drum and drum engaging rollers.

Two bored feed rolls 23 are rotatably mounted on the intermediate portion of the shaft 14 between the bearing brackets 12 and drum engaging rollers 16, they being thus arranged above the support plate 11 on an axis inwardly adjacent the front end of the support plate and in coaxial relation with and being of smaller diameter than the drum engaging rollers. See Figures 3 and 9. These feed rolls comprise bored hubs 24 having their bores engaged for rotation on the shaft, and bored rolls 25 of friction material, such as soft rubber, secured on the hubs for rotation therewith and through the bores of which the hubs extend. A collar 26 is secured, by means of headed set screws 27, on the shaft 14 between the hubs 24, and collars 28 are secured on the shaft at the outer ends of the hubs 24 and serve with the collar 26 as axial thrust bearings for the hubs.

A clutch spring 29, see Figures 3 and 9, has two helical oppositely coiled portions 30 respectively engaged about adjacent ends of the hubs 24 and has a longitudinal portion 31, between the coil portions, engaged in a notch 32 of the collar 26 to secure this portion of the spring with this collar and consequently with the shaft 14. The coil portions 30 are arranged to grip the hubs 24 to drive the feed rolls 23 when the shaft 14 is rotated clockwise in Figures 1 and 2 and to permit overrunning of the feed rolls with respect to the shaft in the same direction, thus providing automatic overrunning clutches for driving the feed rolls from the shaft in the direction to feed sheets to the feed drum 2 as will hereinafter appear.

Angular velocity increasing spur gear transmissions serve to drive the shaft 14 from each of the drum engaging rollers 16, and each transmission comprises, see Figures 3, 7 and 8, relatively large and small spur gears 33 and 34 disposed coaxially of the shaft 14 and respectively secured with a drum engaging roller 16 and with the shaft 14, and a counter gear member 35 rotatably mounted in parallelism with the shaft 14 on a stud 36 secured on the adjacent bearing bracket 12 and provided with relatively small and large spur gears 37 and 38 respectively meshing wth the gears 33 and 34. These angular velocity increasing transmissions serve to drive the feed rolls 23 at a greater angular velocity than and at a peripheral velocity less than that of the drum engaging rollers 16 and consequently at a peripheral velocity less than that of the feed drum 2 for a purpose hereinafter appearing, is being noted that, if the driving engagement between one of the drum engaging rollers and the feed drum 2 can transmit sufficient power to exert the required torque on the feed rolls, only one transmission may be employed, in which case one of the drum engaging rollers does not drive the shaft 14 and merely supports the corresponding end of the shaft.

The support plate 11 is adapted to support a stack of sheets 39 on edge, see Figures 1 and 2, for the advancement thereof against the feed rolls 23, and a pusher 41 is mounted on the support plate for movement longitudinally thereof, in a manner unnecessary to be described, and is yieldably urged by gravity, because of the inclination of the support plate, to advance the stack of sheets facewise against the feed rolls. A positioning device, generally designated at 42, is carried on a rod 43 extending between and secured to the bearing brackets 12 above the feed rolls 23 and extends upwardly from this rod for forward engagement of the front of the sheet stack 39 thereagainst as the pusher 41 advances the stack against the feed rolls 23.

The feed drum 2 rotates counterclockwise in Figure 1 and drives the drum engaging rollers 16 and the feed rolls 23 in the clockwise direction, and the feed rolls grip and sequentially feed the sheets at the front of the stack, as will be seen in Figure 2, to the feed drum 2 which, in cooperation with the pressure rollers 6, grip the sheets and continue to feed the same, the feed rolls being arranged to overlap their engagement with a fed sheet with engagement of the sheet between the upper pressure roller 6 and the feed drum for a purpose hereinafter appearing.

The angular velocity increasing transmissions between the drum engaging rollers 16 and the feed rolls 23 accommodate for the relatively large diameter of the drum engaging rollers as compared with that of the feed rolls by increasing the angular velocity of the feed rolls above that of the drum engaging rollers, so that the peripheral velocity of the feed rolls, though neces-

sarily less than that of the drum engaging rollers and consequently less than that of the feed drum 2 for the spacing of the fed sheets, more closely approaches the peripheral velocity of the drum engaging rollers and the feed drum as compared with driving the feed rolls at the same angular velocity as that of the drum engaging rollers as shown in my aforesaid application, Serial No. 53,646, and the fed sheets are relatively closely spaced, because as a sheet is gripped between the feed drum and the upper pressure roller 6, its velocity is increased only a relatively small extent and it is advanced only a relatively short distance away from the succeeding sheet to provide the close spacing therebetween, the overrunning clutches between the shaft 14 and the feed rolls permitting the sheets to momentarily increase the velocity of the feed rolls and preventing undesirable slippage between the feed rolls and sheets or between the drum engaging rollers and feed drum.

Thus, the diameter of the drum engaging rollers is permitted to be considerably greater than that of the feed rolls to adapt my feeding mechanism for use on the microrecorder shown without necessitating the spacing of the fed sheets being greater than is desired, and it is to be noted that the spacing of the fed sheets may be changed by changing the ratio of the angular velocity increasing transmissions.

The upper sheet supporting surface 44 of the support plate 11 is of a relatively low friction character, so that the sheet stack 39 slides therealong easily, and to promote the sliding of the stack on this surface, spaced portions of the support plate, extending longitudinally of the movement of the sheet stack, are depressed to form depressions 45 in the support surface 44 and spaced sheet supporting portions 46 extending longitudinally of the movement of the stack to present diminished support surface to the sheet stack. See Figures 4 and 6.

The support plate 11 is provided in the region of the feed rolls 23 at the sheet stack side thereof with a series of openings 47 therethrough and spaced longitudinally of the feed rolls. See Figures 2, 4 and 5. An insert of friction material 48, such as soft rubber, comprises a series of spaced insert portions 49 and a flange portion 50 common to the insert portions, and the insert portions are respectively engaged in the openings 47 and have their upper surfaces disposed to be frictionally engaged by edges of the sheets of the stack, their upper surfaces being preferably disposed slightly above the upper or sheet supporting surface of the support plate 11 as shown in Figure 5, and the flange portion underlies and engages upwardly against the lower surface of the support plate. An elongated clamp plate 51 underlies the flange portion 50 and the support plate 11 and is provided with a recess 52 in its upper surface in which the flange portion is engaged, and the clamp plate is secured upwardly against the support plate to clamp the flange portion 50 upwardly against the support plate and thus secure the insert 48 in place by means of certain of the screws 13, see Figure 7, which secure the bearing brackets 12 on the support plate.

The insert portions 49 are engaged by edges of the sheets of the stack at the place where the feed rolls grip and feed the foremost sheet 53 of the sheet stack, see Figure 2, and the insert portions, by reason of their frictional engagement with edges of the sheets promote the separation of the sheets for the sequential feeding thereof and thus serve to minimize the feeding of several sheets at a time.

While I have thus described my invention, I do not wish to be limited to the precise details described, as changes may be readily made without departing from the spirit of my invention, but having thus described my invention, I claim as new and desire to secure by Letters Patent the following:

1. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge and arranged with one end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum, a rotatable feed roll arranged transversely of and above said support plate on an axis inwardly adjacent said end of said support plate and against which said sheet stack is advanced and arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, a rotatable drum engaging roller of greater diameter than said feed roll and arranged on an axis above said support plate and inwardly adjacent said end thereof and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum, and an angular velocity increasing transmission for driving said feed roll from said drum engaging roller for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said drum engaging roller.

2. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge and arranged with one end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum, a rotatable feed roll arranged transversely of and above said support plate on an axis inwardly adjacent said end of said support plate and against which said sheet stack is advanced and arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and said feed drum, a rotatable drum engaging roller of greater diameter than said feed roll and disposed coaxially thereof and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum, and an angular velocity increasing transmission for driving said feed roll from said drum engaging roller for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said drum engaging roller.

3. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping

sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge and arranged with one end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum, a rotatable feed roll arranged transversely of and above said support plate on an axis inwardly adjacent said end of said support plate and against which said sheet stack is advanced and arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, a rotatable drum engaging roller of greater diameter than said feed roll and disposed coaxially thereof and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum, and an angular velocity increasing spur gear transmission for driving said feed roll from said drum engaging roller for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said drum engaging roller and comprising gears disposed coaxially of said feed roll and respectively connected with said feed roll and drum engaging roller and a rotatable counter gear member meshing with said gears.

4. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge and arranged with one end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum, a rotatable feed roll arranged transversely of and above said support plate on an axis inwardly adjacent said end of said support plate and against which said sheet stack is advanced and arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, two spaced rotatable drum engaging rollers of greater diameter than said feed roll and between which said feed roll is disposed and arranged on an axis above said support plate and inwardly adjacent said end thereof and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum, and angular velocity increasing transmission means for driving said feed roll from at least one of said drum engaging rollers for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said one drum engaging roller.

5. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge and arranged with one end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum, a rotatable shaft arranged transversely of and above said support plate on an axis inwardly adjacent said end of said support plate, a rotatable feed roll above said support plate and mounted on said shaft and connected therewith to be driven thereby and against which said sheet stack is advanced and arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, two spaced rotatable drum engaging rollers of greater diameter than said feed roll and between which said feed roll is disposed and rotatably mounted on said shaft and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum, and angular velocity increasing spur gear transmission means for driving said shaft from at least one of said drum engaging rollers and thereby driving said feed roll for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said one drum engaging roller.

6. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge, a rotatable feed roll carried with said support plate and arranged transversely of and above said support plate on an axis inwardly adjacent an end of said support plate and against which said sheet stack is advanced, a rotatable drum engaging roller of greater diameter than said feed roll and carried with said support plate and arranged on an axis above said support plate and inwardly adjacent said end thereof and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum with said support plate positioned with said end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum and with said feed roll arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, an angular velocity increasing transmission carried with said support plate for driving said feed roll from said drum engaging roller for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said drum engaging roller, and a positioning device for positioning said support plate as aforesaid on said sheet handling mechanism with said drum engaging roller engaged downwardly on said feed drum and adapted to permit vertical movement of said support plate whereby weight of said support plate and the mechanism carried therewith presses said drum engaging roller downwardly on said feed drum.

7. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge, a rotatable feed roll carried with said support plate and arranged transversely of and above said support plate on an axis inwardly adjacent an end of said support plate and

against which said sheet stack is advanced, two spaced rotatable drum engaging rollers of greater diameter than said feed roll and between which said feed roll is disposed and carried with said support plate and arranged on an axis above said support plate and inwardly adjacent said end thereof and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum with said support plate positioned with said end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum and with said feed roll arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, angular velocity increasing transmission means carried with said support plate for driving said feed roll from at least one of said drum engaging rollers for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said one drum engaging roller, and a positioning support for positioning said support plate as aforesaid on said sheet handling mechanism with said drum engaging rollers engaged downwardly on said feed drum and comprising a pivot disposed horizontally and radially remote from said drum engaging rollers for permitting vertical movement of said support plate whereby weight of said support plate and the mechanism carried therewith presses said drum engaging rollers downwardly on said feed drum.

8. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge and provided with upwardly extending projections at opposite sides and in the region of one end thereof, a rotatable shaft arranged transversely of and above said support plate on an axis inwardly adjacent said end of said support plate and journaled on said projections, a rotatable feed roll above said support plate and mounted on said shaft between said projections and connected with said shaft to be driven thereby and against which said sheet stack is advanced, two rotatable drum engaging rollers of greater diameter than said feed roll and rotatably mounted on said shaft respectively at the sides of said support plate and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum with said support plate positioned with said end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum and with said feed roll arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, angular velocity increasing spur gear transmission means carried with said support plate for driving said shaft from at least one of said drum engaging rollers and thereby driving said feed roll for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said one drum engaging roller and comprising gears disposed coaxially of said feed roll and respectively connected with said shaft and said one drum engaging roller and a rotatable counter gear member meshing with said gears, and a support on and extending downwardly from said support plate and pivotally engageable downwardly on said sheet handling mechanism in a region horizontally and radially remote from said shaft for positioning said support plate as aforesaid on said sheet handling mechanism with said drum engaging rollers engaged downwardly on said feed drum and permitting vertical movement of said support plate whereby weight of said support plate and the mechanism carried therewith presses said drum engaging rollers downwardly on said feed drum.

9. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge and arranged with one end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum, a rotatable feed roll arranged transversely of and above said support plate on an axis inwardly adjacent said end of said support plate and against which said sheet stack is advanced and arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, a rotatable drum engaging roller of greater diameter than said feed roll and arranged on an axis above said support plate and inwardly adjacent said end thereof and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum, and means for driving said feed roll from said drum engaging roller for the sequential feeding of sheets from said sheet stack to said feed drum and comprising an angular velocity increasing transmission arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said drum engaging roller and an automatic overrunning clutch arranged to drive said feed roll in the direction to feed sheets to said feed drum.

10. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge and arranged with one end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum, a rotatable feed roll arranged transversely of and above said support plate on an axis inwardly adjacent said end of said support plate and against which said sheet stack is advanced and arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, a rotatable drum engaging roller of greater diameter than said feed roll and disposed coaxially thereof and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum, and means for driving said feed roll from said drum engaging roller for the sequential feeding of sheets from said sheet stack to said feed drum and comprising an angular velocity increasing transmission arranged to drive said feed roll from said drum engaging roller at an angular velocity greater than and at a peripheral ve-

locity less than that of said drum engaging roller and an automatic overrunning clutch arranged to drive said feed roll in the direction to feed sheets to said feed drum.

11. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge and arranged with one end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum, a rotatable shaft arranged transversely of and above said support plate on an axis inwardly adjacent said end of said support plate, a rotatable feed roll above said support plate and rotatably mounted on said shaft and against which said sheet stack is advanced and arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, a rotatable drum engaging roller of greater diameter than said feed roll and rotatably mounted on said shaft and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum, an automatic overrunning clutch for driving said feed roll from said shaft in the direction to feed sheets from said stack to said feed drum, and an angular velocity increasing transmission for driving said shaft from said drum engaging roller and thereby driving said feed roll for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said drum engaging roller.

12. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge, a rotatable feed roll carried with said support plate and arranged transversely of and above said support plate on an axis inwardly adjacent an end of said support plate and against which said sheet stack is advacned, a rotatable drum engaging roller of greater diameter than said feed roll and carried with said support plate and arranged on an axis above said support plate and inwardly adjacent said end thereof and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum with said support plate positioned with said end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum and with said feed roll arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, means carried with said support plate for driving said feed roll from said drum engaging roller for the sequential feeding of sheets from said sheet stack to said feed drum and comprising an angular velocity increasing transmission arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said drum engaging roller and an automatic overrunning clutch arranged to drive said feed roll in the direction to feed sheets to said feed drum, and a positioning device for positioning said support plate as aforesaid on said sheet handling mechanism with said drum engaging roller engaged downwardly on said feed drum and adapted to permit vertical movement of said support plate whereby weight of said support plate and the mechanism carried therewith presses said drum engaging roller downwardly on said feed drum.

13. In an automatic sheet feeding mechanism for use on a sheet handling mechanism provided with a horizontal driven rotatable sheet feed drum and pressure gripping means for gripping sequentially fed sheets between it and said drum for the feeding of the sheets, the combination of sheet stack supporting and advancing means comprising a support plate for supporting a stack of sheets on edge, a rotatable shaft carried with and arranged transversely of and above said support plate on an axis inwardly adjacent an end of said support plate, a rotatable feed roll above said support plate and rotatably mounted on said shaft and against which said sheet stack is advanced, a rotatable drum engaging roller of greater diameter than said feed roll and rotatably mounted on said shaft and projecting below said support plate and adapted to have rolling driven engagement downwardly on said feed drum with said support plate positioned with said end thereof in adjacent tangential sheet feeding relation with the upper portion of said feed drum and with said feed roll arranged to overlap its engagement with a fed sheet with engagement of the sheet between said gripping means and feed drum, an automatic overrunning clutch carried with said shaft and feed roll for driving said feed roll from said shaft in the direction to feed sheets from said stack to said feed drum, an angular velocity increasing transmission carried with said support plate for driving said shaft from said drum engaging roller and thereby driving said feed roll for the sequential feeding of sheets from said sheet stack to said feed drum and arranged to drive said feed roll at an angular velocity greater than and at a peripheral velocity less than that of said drum engaging roller, and positioning means for positioning said support plate as aforesaid on said sheet handling mechanism with said drum engaging roller engaged downwardly on said feed drum and comprising a support on and extending downwardly from said support plate and detachably pivotally engageable downwardly on said sheet handling mechanism in the region of the other end of said support plate whereby weight of said support plate and the mechanism carried therewith presses said drum engaging roller downwardly on said feed drum.

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