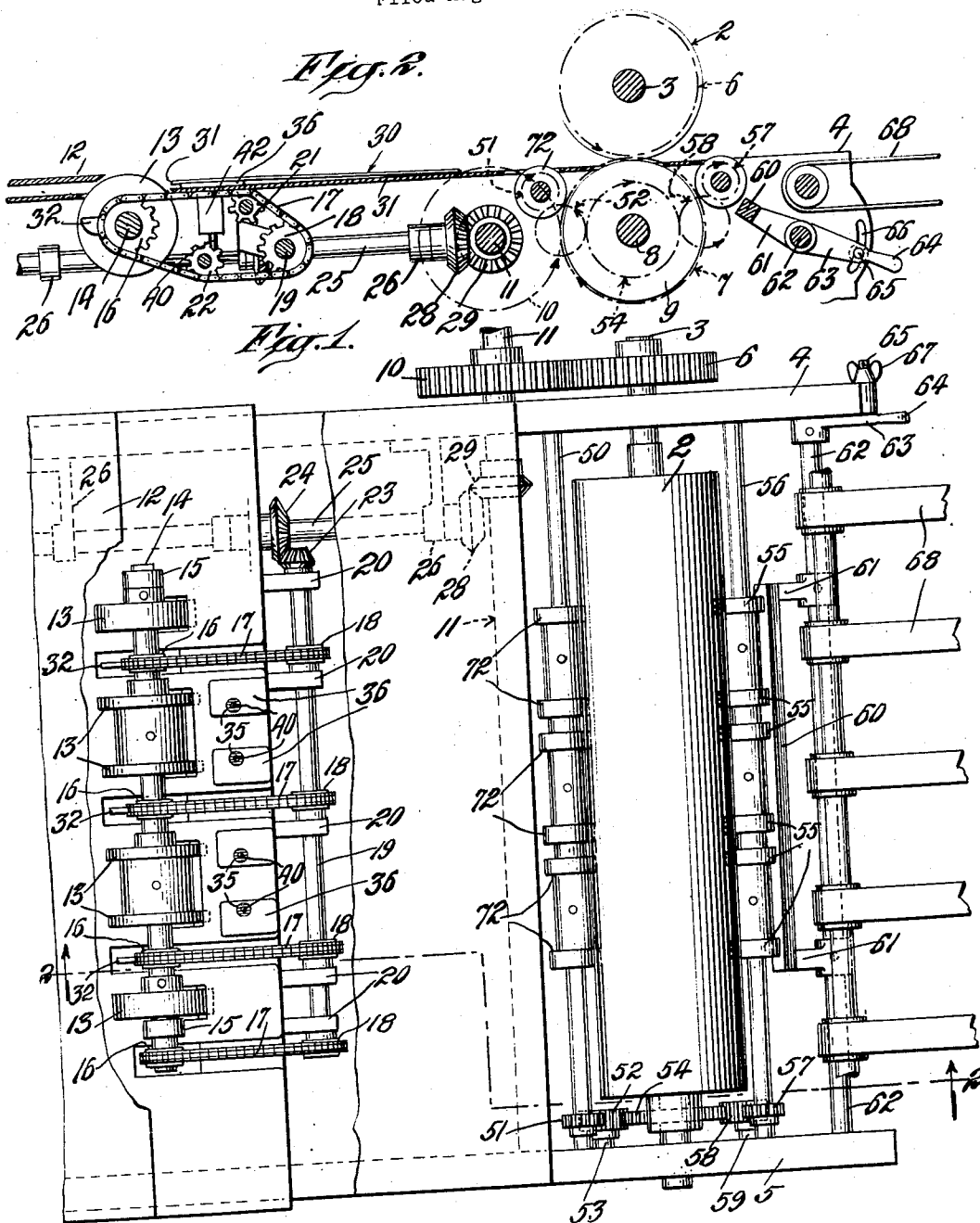


June 20, 1939.

A. HORMEL
SHEET FEEDING MACHINE
Filed Aug. 4, 1938

2,162,889

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 3.

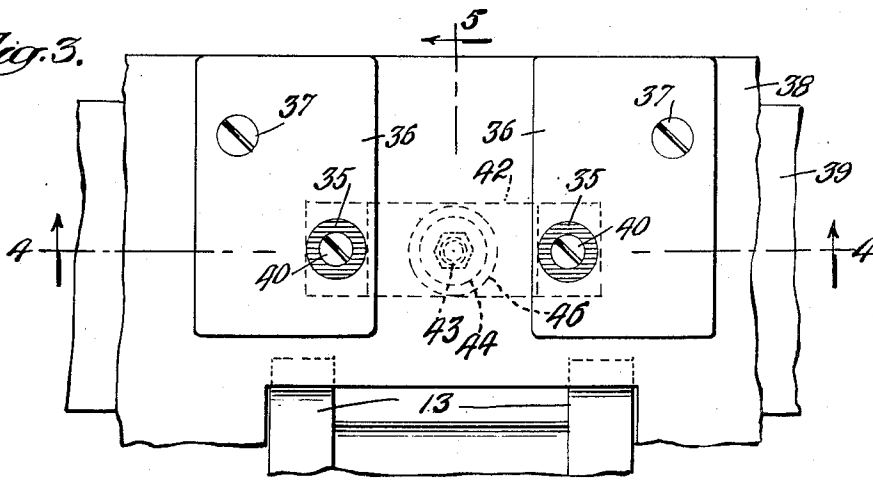


Fig. 4.

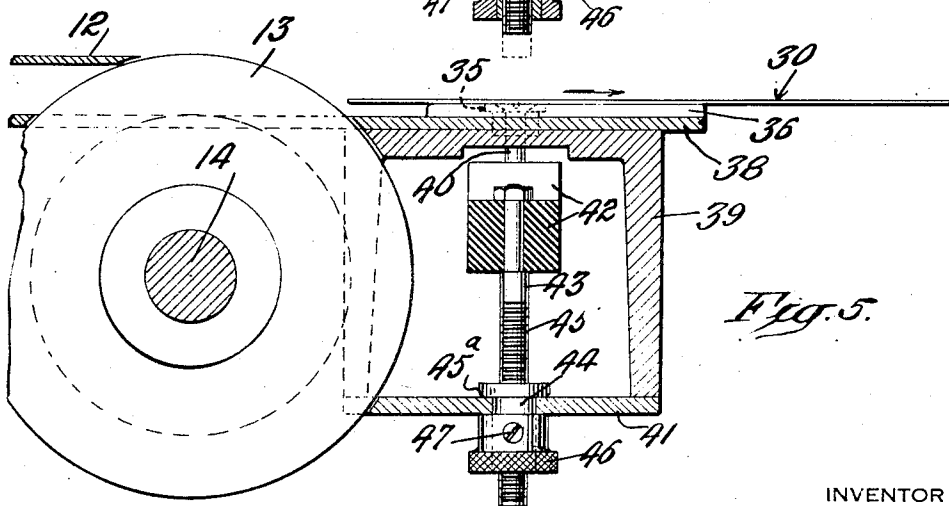
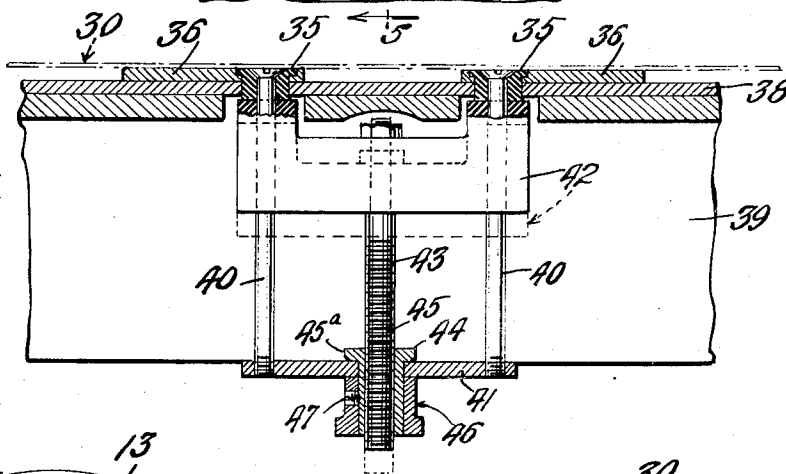


Fig. 5.

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2,162,889

SHEET FEEDING MACHINE

August Hormel, Hoboken, N. J., assignor to National-Standard Company, a corporation of Michigan

Application August 4, 1938, Serial No. 223,028

10 Claims. (Cl. 271—51)

This invention relates to sheet metal feeding mechanisms of the character shown in my prior Patent No. 2,114,108, dated April 12, 1938, wherein the metal sheets are fed to impression or im-

printing mechanisms which apply lacquer or varnish coatings to the sheets, the portions of the sheets so coated being usually subsequently used for the formation of cans or containers, or for other purposes.

The object of the present invention is to provide a feeding mechanism for sheets of the character described wherein the use of magnets of the so-called "permanent" type, both in fixed and roller form, are utilized as feeding instrumentalities for engaging and holding, as well as moving, the metal sheets.

Another object of the invention is the provision of means by which the strength of the magnetism exerted by the magnetic rollers and other fixed magnetic elements may be varied to meet various requirements and to accommodate the various sizes and weights of sheets handled by the feeding mechanism. Other objects of the invention will appear hereinafter.

In the accompanying drawings, in which an embodiment of the invention is shown, Fig. 1 is a plan view of the improved feeding mechanism, with parts broken away to disclose construction; Fig. 2 is a sectional view on the line 2—2 of Fig. 1, looking in the direction of the arrows; Fig. 3 is a plan view of one of the fixed magnetic sheet-holding elements and associated parts; Fig. 4 is a sectional view on the line 4—4 of Fig. 3, looking in the direction of the arrows; and Fig. 5 is a sectional view on the line 5—5 of Fig. 3, looking in the direction of the arrows.

With reference to the portion of the structure shown in Figs. 1 and 2, the impression roller to which the sheets to be coated or lacquered are fed is shown at 2, the same being secured on the shaft 3 journaled in the side frames 4 and 5 of the machine. Shaft 3 carries a gear 6 which meshes with and is driven by a gear 7 on the shaft 8 of the bed roller 9 mounted below the impression roller in the manner well understood in the art. The sheets to be imprinted are fed between the two rollers 2 and 9 from the left, as viewed in Figs. 1 and 2. Gear 7 on the shaft 8 meshes with a gear 10 on the end of a drive shaft 11 rotatively supported in the frame members 4 and 5, said shaft being directly or indirectly driven from any suitable source of power.

The sheets to be imprinted are delivered to the feeding mechanism by any suitable conveyor means and are received upon a supporting ele-

ment 12 from which they are removed by a series of permanent magnetic rollers 13, all mounted upon the shaft 14 supported in the bearings 15. Shaft 14 carries four sprockets 16 situated between the magnetic rollers, said sprockets being driven by the chains 17 extending from the sprockets 18 secured on the shaft 19 supported in the bearings 20. The chains 17 are also extended over the idlers 21 and 22. Shaft 19 is provided with the bevel gear 23 engaging with the bevel gear 24 on shaft 25 supported in the bearing brackets 26 and carrying bevel gear 28 which meshes with a bevel gear 29 on the drive shaft 11.

Each sheet metal plate, one of which is shown at 30, in Fig. 2, is moved by the magnetic rollers 13 toward the right and upon leaving the rollers 13 it comes to rest on top of a table or supporting plate 31 situated intermediate of the magnetic feed rollers 13 and the impression and bed rollers 2 and 9 respectively, where it is held for a short period of time by magnetic means until the edge 31 of the plate is engaged by feed lugs 32, one of which is carried by each of the chains 17. These lugs 32 move the plate toward the right, as viewed in Figs. 1 and 2, until it is magnetically engaged by magnetic rollers 72 of the permanent magnet type and moved by them between the impression and bed rollers 2 and 9 respectively.

The magnetic means for holding the plate 30 in position of rest upon the table 31 comprises the four disks or buttons 35 of iron, steel, or other magnetizable metal set into brass plates 36 secured by the screws 37 to the top of supporting plate 38 which co-operates with or forms a part of table 31 and which is of brass or other non-magnetic material. Supporting plate 38 rests upon and is secured to a channelled supporting bar 39, also of a non-magnetic material. The disks or buttons 35 are held in position by means of the long screws 40, clearly shown in Fig. 4, which have their lower ends threaded into a plate 41 located at the lower end of the bar 39. These screws 40 form guides for the legs or poles of a horse-shoe magnet 42, attached to the upper end of a threaded shaft 43 which extends downwardly through a threaded bushing 44 mounted on the threaded portion 45 of the stud 43 and rotatable in an opening in plate 41.

Bushing 44 is held from displacement out of plate 41 by means of its enlarged head 45a co-operating with an outer member or nut 46, secured to the bushing by means of the set screw 47. The outer member 46 constitutes a nut

which, when rotated, will rotate the bushing 44 with it and cause the horse-shoe magnet 42 to be raised or lowered on the screws or guides 40. Thus, by lowering magnet 42 to an extent desired away from the disks or buttons 35, the degree or extent of magnetism in buttons 35 will be reduced accordingly so that the magnetic engagement of the same with plate 30 will be lessened. Reversely, when magnet 42 is raised toward the disks or buttons 35 by manipulation of the nut 46, the degree of magnetism in the disks or buttons will be increased. By this simple arrangement, the force by which the plate 30 is magnetically attracted and held by the spaced magnetized buttons 35 can be easily controlled.

When the lugs 32 engage against the end 31 of plate 30, they move the plate away from the magnetic buttons 35 and slide it over the surface of the table 31 until the right end of plate 30 is moved over the magnetic rollers 72 which move the plate between the impression roller 2 and its companion roller, the bed roller 9, where the plate is coated. Magnetic rollers 72 are mounted on a shaft 50 journaled in the side frames 4 and 5 of the machine, said shaft being provided at one end with a gear 51 which meshes with an idle gear 52 mounted on a stud shaft 53 and engaging and being driven by a gear 54 on shaft 8.

After passing between the impression roller 2 and the bed roller 9, the plate is then magnetically engaged by magnetic rollers 55 of the permanent magnet type mounted on shaft 56 journaled in the sides 4 and 5 of the frame. Shaft 56 carries at one of its ends a gear 57 which meshes with the idle gear 58 on the stud shaft 59, said idle gear 58 being engaged and driven by the gear 54 on shaft 8. The extent of magnetic force exerted by the permanent magnetic rollers 55 is regulated by means of a bar 60, or iron, steel or other magnetizable metal, secured at its ends on the arms 61 extending radially from shaft 62, mounted to be rocked in the side frames 5 and 4 of the machine. Shaft 62 carries a radially projecting arm 63 terminating in a handle 64 and provided with a stud 65 extending into an arcuate slot 66 in the side frame 4 of the machine. The stud 65 is threaded for the reception of a wing nut 67 by which the stud may be set at any desired position in slot 66, to thereby hold any selected position of bar 60 with respect to the magnetic rollers 55.

It will be obvious that as the bar 60 is swung toward magnetic rollers 55, it will decrease the extent of magnetism in the rollers and thus, the rollers will magnetically grip the plate 30 fed to them with a reduced degree of magnetism. On the other hand, when the bar 60 is swung away from the rollers 55, the degree of magnetism in rollers 55 will be increased and the rollers will then more firmly magnetically grip the plate 30. This is of importance since the force exerted to grip and move plates of various sizes and weights by means of the rollers 55 can be easily regulated by the simple shifting of the bar 60 and setting it at any desired position.

Rollers 55, upon engaging the plate 30, cooperate with rollers 72 in moving the plate from between the impression and bed rollers to belt conveyor 68 which receives and carries the coated plate away from the coating mechanism.

By the means described, the magnetic force exerted by the feed rollers and by the plate halting means is easily regulated, and thus, the amount of magnetism required to feed and han-

dle plates of various sizes and weights is easily controlled.

What I claim is:

1. In a metal plate-feeding machine, means for halting a plate in a position of rest, said means comprising magnetized elements upon which the plate is rested, a magnet mounted adjacent to said elements and means for mounting said magnet whereby it may be moved to or from the magnetized elements to govern the magnetic force exerted by the magnetized elements upon the plate.

2. In a machine of the character described, a magnetic roller of the permanent magnet type for magnetically gripping a plate and moving the same, an element of magnetizable material mounted adjacent to the roller, and a mounting for said element by which the same may be moved to or from the periphery of the roller to thereby regulate the strength of the magnetic attraction exerted by the roller on the plate engaged by it.

3. In a machine of the character described, a magnetic roller for feeding a metal plate, and a magnetizable element mounted near the roller and movable to and from the same to vary the magnetic attraction of the roller for the plate.

4. In a machine of the character described, a magnetic feed roller for a metal plate, a bar of magnetizable material pivotally mounted near the periphery of the roller, means for moving the bar to or from the periphery of the roller to thereby vary the magnetic attraction of the roller for the metal plate, and means for fixing the bar in any selected position relative to the periphery of the roller.

5. In a machine of the character described, a support, rollers for feeding a metal plate to a position of rest upon said support, means on the support to magnetically hold the plate brought to rest thereon, said means comprising spaced sections of magnetizable material on the support and magnets mounted adjacent said sections, means for adjusting said magnets to or from the sections, magnetic feed rollers for moving the plate from the support, a magnetizable element mounted adjacent the periphery of said feed rollers, and means for adjusting the magnetizable element to and from the magnetic feed rollers to thereby vary the magnetic attraction of the said rollers for the plate engaged by them.

6. In a machine of the character described, a support of non-magnetic material on which a plate of magnetic material is brought to rest, a pair of spaced disks mounted in said support, a magnet of horse-shoe type mounted below the support with its poles directed toward the disks and exerting magnetic attraction thereon, and means for raising and lowering the magnet to thereby bring its poles closer to or farther away from the disks.

7. In a machine of the character described, a roller of the permanent magnetic type for engaging and feeding a plate of magnetic metal, a bar of magnetic metal pivotally mounted adjacent the periphery of the roller whereby said bar may be swung to or from the periphery of the roller, an arm extending from the bar for moving the same relative to the roller, and means for engaging the arm and holding the same at a selected position to thereby regulate the position of the bar with respect to the roller.

8. In a machine of the character described, a support for a metal plate to be fed, means for holding the plate on said support comprising a section of magnetizable material mounted in the

support and against which the plate is brought to rest, a magnet mounted adjacent said magnetizable material and means for adjusting the position of the magnet relative to the magnetizable material to thereby vary the strength of the magnetic attraction exerted by the magnetizable material for the plate.

9. In a machine of the character described, a support for a metal plate to be fed, spaced sections of magnetizable material mounted in the support over which the plate is brought to rest, a magnet mounted adjacent said spaced sections and having its poles in close proximity to the

sections, and a mounting for the magnet by which the same may be brought to and from the sections to thereby vary the strength of the magnetic attraction exerted by the sections by the plate brought into contact with them.

10. In a machine of the character described, a support on which a metal plate rests, spaced disks of magnetic material mounted in the support and on top of which the plate is rested, a magnet of the permanent type movably mounted below the disks, said magnet being mounted so that its poles are adjustable to and from the disks.

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