

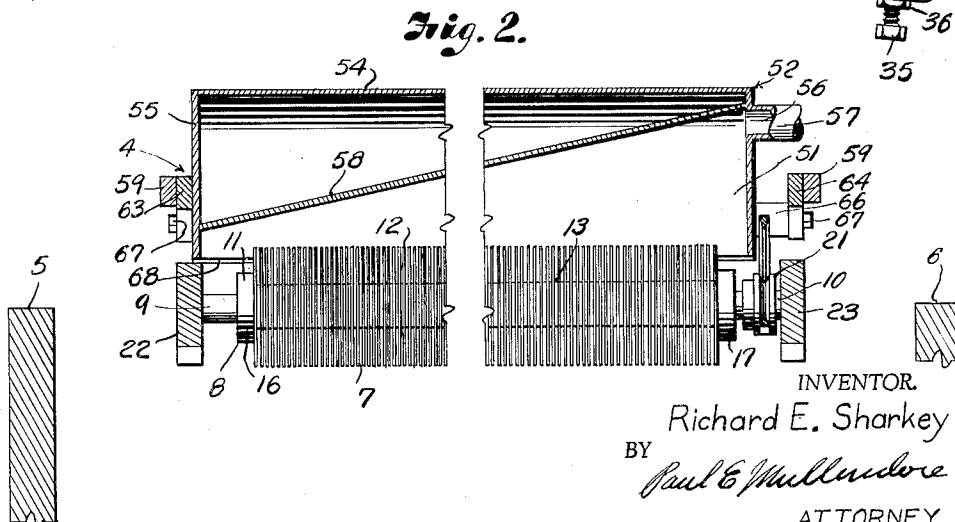
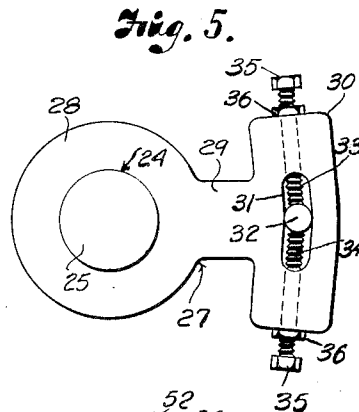
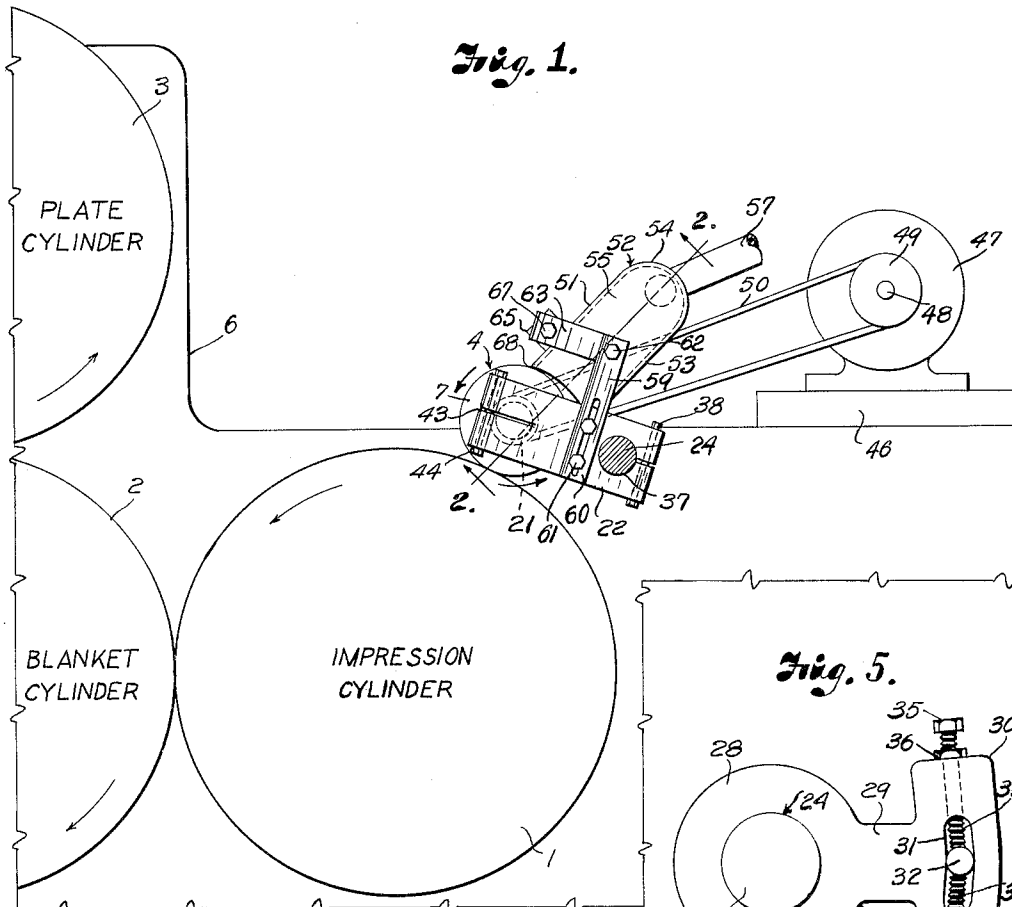
Nov. 16, 1965

R. E. SHARKEY
MECHANISM FOR REMOVING DUSTING POWDER OR
LOOSE PARTICLES FROM SHEETS OR WEBS

3,217,646

Filed Aug. 8, 1962

2 Sheets-Sheet 1



INVENTOR
Richard E. Sharkey
BY
Paul E. Mullendore
ATTORNEY

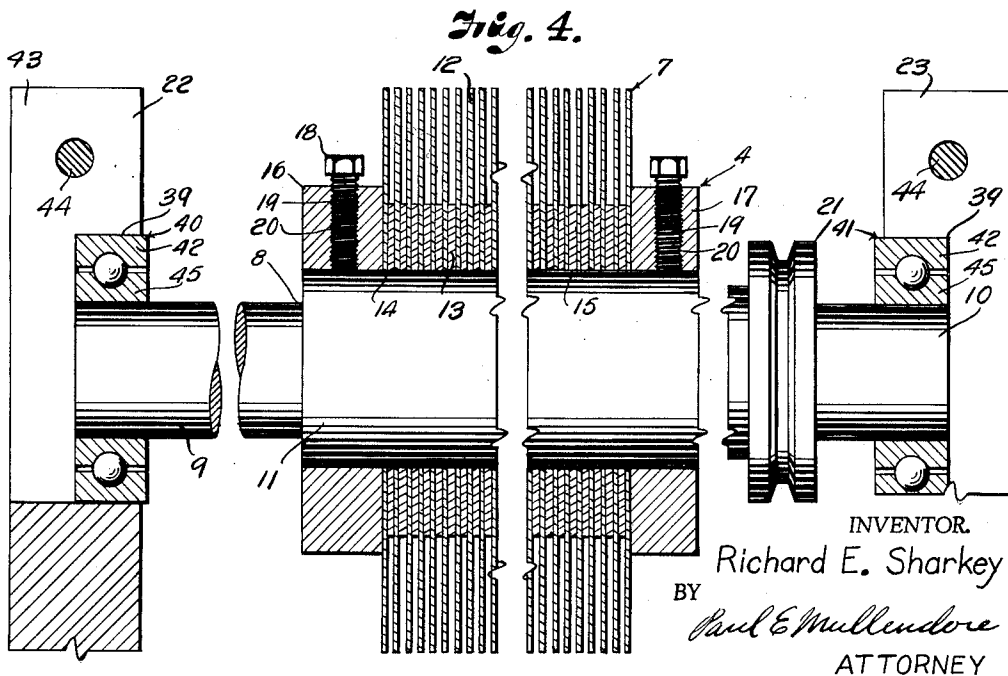
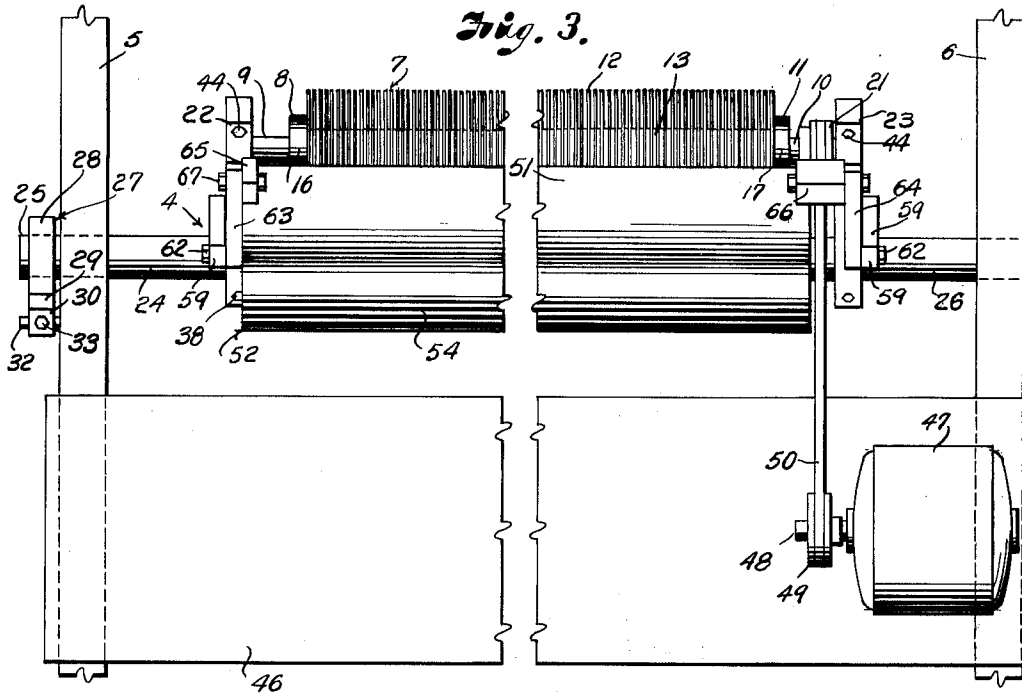
Nov. 16, 1965

R. E. SHARKEY
MECHANISM FOR REMOVING DUSTING POWDER OR
LOOSE PARTICLES FROM SHEETS OR WEBS

3,217,646

Filed Aug. 8, 1962

2 Sheets-Sheet 2



INVENTOR.

Richard E. Sharkey

BY

Paul E. Mullendore

ATTORNEY

1

3,217,646

MECHANISM FOR REMOVING DUSTING POWDER
OR LOOSE PARTICLES FROM SHEETS OR
WEBSRichard E. Sharkey, 3922 Campbell St.,
Kansas City, Mo.

Filed Aug. 8, 1962, Ser. No. 215,717

6 Claims. (Cl. 101—425)

This invention relates to a mechanism for removing dusting powder, lint and other particles from sheets or webs prior to printing thereof.

For example, it is common practice to apply dusting powder to the surface of freshly inked sheets or webs as they are delivered from a printing press, to dry the ink and prevent smearing and/or offsetting thereof when the sheets are stacked in face to face contact. There are times when it is desirable to rerun such sheets through the printing press to add additional printing and/or color; however, the dusting powder applied during a previous run interferes with application of additional ink and an imperfect printing results. Prior to the present invention various mechanisms have been devised for removing such powder, principally by suction, but the mechanisms necessitate movement of such large volumes of air that the blowers, ductwork, dust separators, and motive power make them very expensive to install and expensive to operate. While such mechanisms operate to a degree, they are not completely satisfactory, and the noise of operation is extremely objectionable.

Therefore, the principal objects of the present invention are to provide a relatively simple mechanism to effectively remove the dusting powder; to provide a mechanism that is easily attached to existing printing presses; to provide a motor driven brush that sweeps the surface of the sheets at the time they are started onto the impression cylinder and before they reach contact with the blanket cylinder of the printing press; to provide a novel brush construction that may be operated at high speed without injury to the paper or printing thereon; and to provide for removal of the dusting powder from the brush.

In accomplishing these and other objects of the invention as hereinafter pointed out, I have provided improved structure, the preferred form of which is illustrated in the accompanying drawings, wherein:

FIG. 1 is a side elevational view of a mechanism constructed in accordance with the present invention and showing attachment thereof to a printing press that is diagrammatically illustrated, since the specific construction of the press forms no part of the present invention.

FIG. 2 is a section on the line 2—2 of FIG. 1.

FIG. 3 is a plan view of the mechanism.

FIG. 4 is an enlarged longitudinal section through the dusting brush and showing the journal mounting thereof.

FIG. 5 is a fragmentary view showing the adjusting device for adjusting and retaining the dusting brush in adjusted position to give the desired contact of the brush with the sheets or web.

Referring more in detail to the drawings:

1, 2, and 3 designate the impression, blanket and plate cylinders, respectively, of a printing press that is shown diagrammatically in FIG. 1. The press may be of any conventional design and the sheets to be printed are fed from a stack or a roll, not shown, to the impression cylinder 1, which seizes the individual sheets and carries them to the blanket cylinder 2 that has received an impression from the plate cylinder 3. When the press includes only two stands of cylinders, only two colors can be printed on one run through the press, and after a job has been completed with two colors, it is necessary to rerun the

2

printed sheets to apply one or more additional colors, as the job requires. However, a dusting powder has been applied to each sheet upon delivery from the press on the first run, to promote drying of the ink and prevent smearing and/or offsetting of the sheets when they are stacked one upon another. Consequently, the dusting powder from the previous run interferes with application of additional colors on the rerun, and it is desirable to provide the press with means for removing the dusting powder from the sheets prior to their contact with the blanket cylinder.

In accordance with the present invention, such means includes a dust removal mechanism 4 attached to the side frames 5 and 6 of the printing press and in a position over the impression cylinder 1 to make contact with the sheets carried thereon. The mechanism 4 includes a brush 7. The preferred form of brush is best illustrated in FIG. 4. The brush 7 includes a shaft 8, having reduced ends 9 and 10. Mounted on the enlarged portion 11 of the shaft 8 and extending entirely across the impression cylinder are brushing elements, which in the illustrated instance comprise a series of fabric disks 12 alternating with spacer disks 13.

The fabric disks 12 are stamped in circular formation from a suitable fabric material, such as muslin, which has the warp and woof threads closely woven. After the disks are stamped to shape, they are preferably impregnated with a bonding material, such as thinned shellac, to limit raveling of the peripheries thereof when the brush is in operation. The fabric disks 12 have central openings 14 (FIG. 4) to closely fit the enlarged portion of the shaft. The spacer disks 13 may be formed of a suitable light weight, more rigid material, such as cardboard, and have central openings 15 also closely fitting the enlarged portion of the shaft. The spacer disks are of considerably smaller diameter than the diameter of the fabric disks, to leave substantially free flexible peripheral margins for flexing contact with the sheets. The disks 12 and 13 are threaded one after another onto the shaft and are clamped together between collars 16 and 17 that are mounted on the ends of the enlarged portion 11. The collars are fixed to the shaft by fastening devices, such as set screws 18 having threaded shanks 19 engaging in threaded openings 20 of the collars, so that the ends of the shanks bear upon the periphery of the shaft.

Fixed to one of the reduced ends of the shaft, for example, the end 10, is a pulley 21 by which the brush is rotated.

The mounting for the shaft 8 consists of arms 22 and 23 that are clamped to a transverse support 24 of the press. The support 24 is in the form of a cylindrical rod and has its ends 25 and 26 journaled for adjustment in the side frames 5 and 6 of the press by means of an adjusting device 27. The adjusting device is best illustrated in FIG. 5 and has a collar portion 28 fixed to a projecting end of the rod 24 on the outer side of the side frame 5. Extending from the collar 28 is a neck 29 carrying a T-shaped head 30 having a slot 31 therein. Extending through the slot 31 is a pin 32 projecting from the side frame 5. Carried by the head 30 at the opposite ends of the slot are adjusting screws 33 and 34 for engaging the pin 32 and which have heads 35 and lock nuts 36.

The arms 22 and 23 have slotted openings 37 for mounting the arms in spaced apart relation on the rod 24. Extending through the arms at the outer side of the opening and across the slot thereof are screws 38 by which the arms are clamped to the rod. The opposite ends of the arms 22 and 23 have cylindrical recesses 39 (FIG. 4) in their inner side faces for mounting anti-friction bearings 40 and 41, respectively. The outer races 42 of the bearings 40 and 41 are clamped in the recesses by slotting the ends of the arms, as indicated at

43, and tightening the bearings in the recesses by bolts 44. The inner races 45 of the antifriction bearings 40 and 41 carry the reduced ends 9 and 10 of the shaft 8 therein.

Carried upon the side frames 5 and 6 of most presses is a walkway 46, which may serve to mount a motor 47 (FIGS. 1 and 2) on the end carried by the side frame 6. The armature shaft 48 of the motor carries a pulley 49 in alignment with the pulley 21 on the brush shaft 8. Operating over the respective pulleys is an endless belt 50.

To prevent the powder from being carried around on the periphery of the brush, I provide a scraper blade 51 that contacts the peripheral edges of the fabric disks 12 on the side opposite to the contact point of the brush with the sheets, as later described. In the illustration, the scraper blade 51 constitutes the rear side wall of a duct or housing 52, having a front wall portion 53 extending parallel with the scraper blade 51 and which is connected at the upper edge with the scraper blade portion by a rounding top 54. The bottom edge of the front wall terminates short of the brush, so that the dusting powder is removed within the duct. The duct has end walls 55 and 56 and one of the walls, for example, the wall 56, carries a discharge hose 57 leading to a suitable disposal for the dust, such as a dust trap, not shown.

In order to facilitate discharge of the dust to the discharge hose, a baffle 58 (FIG. 2) extends longitudinally of the interior of the duct 52 and slopes outwardly from the brush to the discharge hose.

The duct or housing 52 is adjustably carried by the arms 22 and 23 as now to be described. Connected with the arms 22 and 23 are uprights 59, having slotted lower ends 60 that are fixed to the arms 22 and 23 by fastening devices 61 that extend through the slots. Pivotaly mounted on the upper ends of the uprights by fastening devices, such as bolts 62, are arms 63 and 64 that extend forwardly of the arms 22 and 23 to connect by fastening devices 67 with lugs 65 and 66 on the respective ends of the scraper blade portion of the duct or housing 52.

Assuming that the dusting roller brush is constructed and assembled as described, the peripheries of the fabric disks are fluffed slightly, so that they are softened sufficiently to avoid any marking or striation of the sheets to be fed through the press.

In installing the dusting mechanism on a press, the arms 22 and 23 are applied to the rod 24, if such a rod is present on the press. If not, a rod must be secured in substantially the manner of the rod 24. The ends of the dusting roller shaft are mounted in the antifriction bearings 40 and 41, the arms being positioned so that the brush extends across the impression cylinder by adjusting the position of the arms 22 and 23 of the rod. The bolts 38 and 44 are tightened to clamp the arms 22 and 23 to the rod 24 and to retain the bearings 40 and 41. The adjusting arm 27 is then applied and fixed to the end 25 of the rod 24, with the slot 31 passing over the pin 32. The screws 33 and 34 are then adjusted by backing off one or the other and tightening the opposite screw until the peripheries of the fabric disks just make contact with the surface of the sheets carried by the impression cylinder. The duct or housing 52 is attached to the arms 63 and 64 and the opposite ends of the arms are attached to the uprights 59. The scraper blade portion 51 of the housing or duct 52 is adjusted so that the lower edge 68 just contacts the peripheries of the fabric disks 12, after which the fastening devices 61, 62 and 67 are tightened to hold the housing 52 at a proper angle relative to the periphery of the dusting roller, so that the lower edge of the front wall 53 is spaced above the brush, to allow the dust to pass thereunder. The hose 57 is connected with a place for disposal of the dust. After mounting the motor 47 and connecting the pulleys 21 and 49 by the belt 50, the mechanism is ready to operate.

Assuming that previously printed sheets are to be fed

from a stack onto the impression cylinder, the sheets are carried at the speed of the cylinder under the periphery of the dusting brush 4, which rotates in counter direction at a much higher peripheral speed, to sweep the dust from the surface of the sheets. The high speed rotation of the brush sets up circumferential currents in the direction of rotation of the brush that pick up and carry the dust therewith, but the scraper blade portion 51 of the housing directs the air currents and dust carried thereby up the baffle 58 for discharge through the hose 57.

The dusting roller is, of course, subjected to slight wear, but it is easily kept in contact with the sheets by manipulating the screws 33 and 34 from time to time to maintain the brush contact that effects best removal of the dusting powder.

While I have illustrated and described the invention as an attachment for existing presses, it is obvious that it may be built into the press, or the mechanism may be used as a separate machine for cleaning the surface of sheets for any purpose, such as the application of coatings, finishes and the like.

From the foregoing, it is obvious that I have provided a dusting mechanism that is of simple construction and readily installed on existing presses.

What I claim and desire to secure by Letters Patent is:

1. A suctionless mechanism for removing dusting powder from printed sheets under movement in a printing press and prior to reprinting thereof, including a generally cylindrical brush, means for rotatably supporting the brush in contact with the sheets, means for rotating the brush at a speed sufficient to create a circumferential flow of air about the periphery of the brush to pick up and convey the dusting powder, a housing disposed above and coextensive with and completely exteriorly of the brush and having front and rear wall portions relatively to the direction of rotation of the brush and a top and end portions providing an open bottom duct along the length of the brush, means supporting the housing above the brush with said front wall only spaced from the periphery of the brush to pass the circumferential flow of air and the dusting powder carried thereby into the housing and said rear wall in contact with the brush to interrupt and deflect the circumferential flow of air and dusting powder to an outlet in the housing, and a duct connected with the outlet of the housing for conveying away the air flow and the dusting powder carried therewith under air velocity imparted solely by rotation of the brush.
2. A mechanism for removing dusting powder from printed sheet under movement in a printing press and prior to reprinting thereof as described in claim 1, wherein the outlet is located in the upper portion of the housing at one end thereof, and a baffle extending between the front and rear walls and sloping from the bottom of the opposite end of the housing upwardly toward the outlet.
3. A suctionless mechanism for removing dusting powder from printed sheets under movement prior to reprinting thereof, including a series of soft resilient disks slightly spaced apart and rotatable on a common axis as an assembly, means for rotatably supporting the disk assembly with peripheries of the disks in contact with the sheets, means for rotating the disk assembly at a speed sufficient to create a circumferential flow of air about the peripheries of the disks to pick up and carry the dusting powder, a housing disposed above and coextensive with and completely exteriorly of said disk assembly and having front and rear wall portions relatively to the direction of rotation of said disk assembly and a top

5

and end portions providing an open bottom duct along the length of the assembly,
 means supporting the housing above the disk assembly with the front wall spaced from the peripheries of the disks to pass the circumferential flow of air and the dusting powder therewith into the housing and the rear wall in contact with the peripheries of the disks to interrupt and deflect the circumferential flow of air with the dusting powder to an outlet in the housing, and
 a duct connected with said outlet for conveying away the air flow and the dusting powder carried therewith under air velocity imparted solely by rotation of the disk assembly.
 4. A mechanism for removing dusting powder from printed sheets under movement prior to reprinting thereof as described in claim 3, wherein
 the outlet is in the upper portion of the housing at one end thereof, and
 a baffle extending between the front and rear walls and sloping from the bottom of the opposite end of the housing upwardly toward the outlet.
 5. A mechanism for removing dusting powder from printed sheets under continuous movement in a printing press prior to reprinting thereof, including
 a generally cylindrical brush having a shaft,
 a rod extending transversely of travel of the sheets, arms fixed to the rod and carrying journals rotatably mounting the shaft therein,
 an adjusting lever fixed to the shaft,
 opposed set screws carried by the adjusting lever for engaging a part on the press for adjustably supporting the brush in contact with the sheets,
 means connected with the shaft for rotating the brush at a speed to create a circumferential flow of air about the periphery of the brush to pick up the dusting powder,
 a housing coextensive with the brush and having front and rear wall portions relatively to the direction of

6

rotation of the brush and a top and end portions providing an open bottom duct along the length of the brush,
 means for supporting the housing above the brush with the front wall spaced from the periphery of the brush to provide an entrance into the housing for the circumferential air flow carrying the dusting powder therewith and the rear wall in contact with the brush to interrupt and deflect the circumferential flow of air with the dusting powder under pressure to an end of the housing,
 means in said housing supporting means for adjusting tilt of the housing to vary size of said entrance, and
 a duct connected with said end of the housing for conveying away the air flow carrying the dusting powder under velocity imparted by rotation of the brush.
 6. A mechanism for removing dusting powder from printed sheets in continuous movement in a printing press prior to reprinting thereof as described in claim 5, wherein said housing supporting means includes
 uprights carried by the arms,
 arms extending forwardly from the uprights, and
 means connecting the last-named arms with the housing.

References Cited by the Examiner

UNITED STATES PATENTS

188,670	3/1877	Poole	15—230
437,863	10/1890	Marvin et al.	101—425
539,268	5/1895	Hemphill	101—416
1,043,812	11/1912	Doyle	101—425
1,089,453	3/1914	Wood	101—425
1,428,931	9/1922	Barber	101—425 X
2,384,599	9/1945	Case	15—230 X
2,482,781	9/1949	Knowlton et al.	15—308 X
2,918,691	12/1959	Lake	15—308

ROBERT E. PULFREY, *Primary Examiner*.