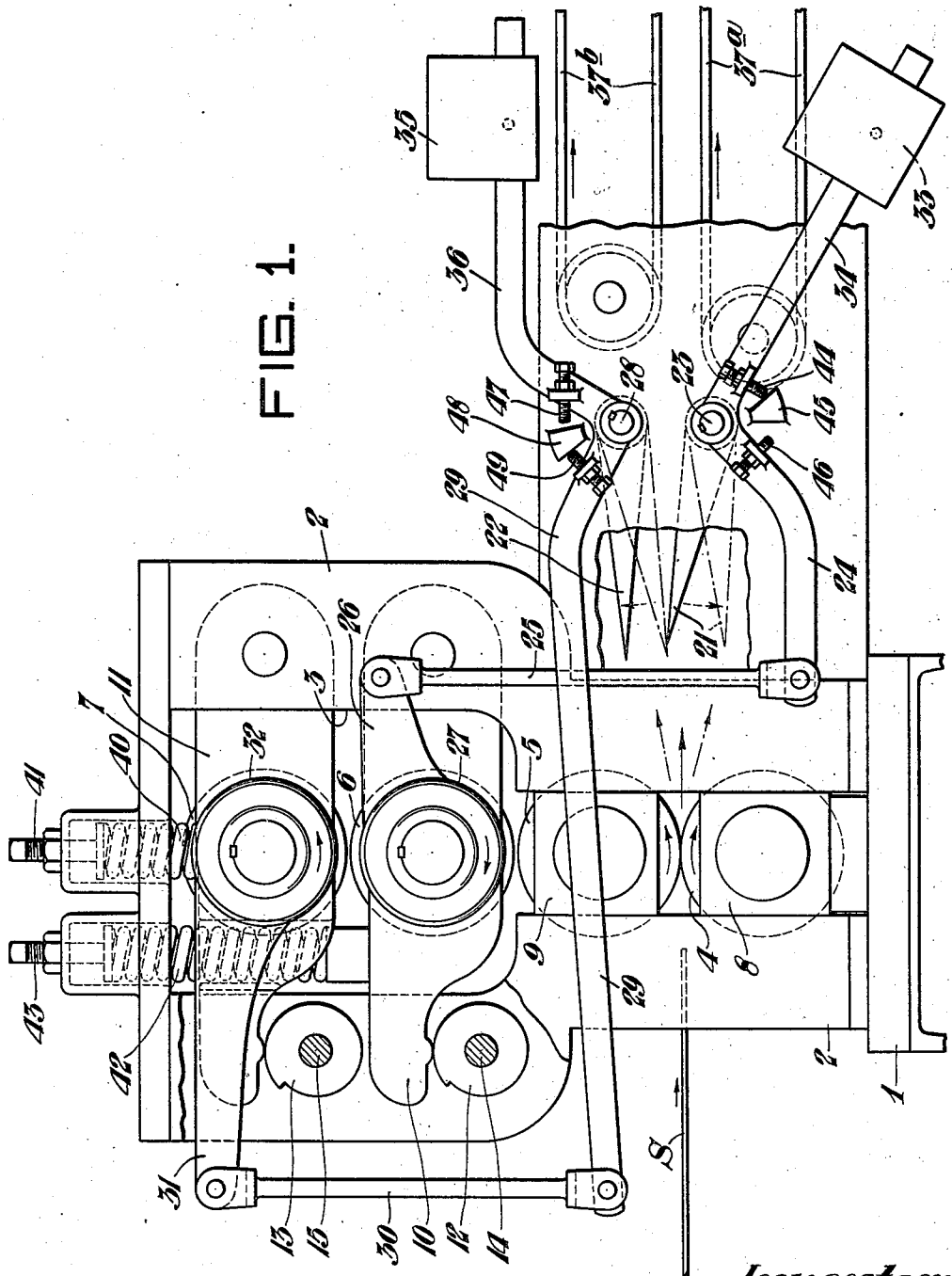
Dec. 1, 1942. D. BUCCICONE 2,303,681

SHEET GAUGING AND SORTING MECHANISM

Filed April 17, 1941 2 Sheets-Sheet 1

FIG. 1.



Inventor:
DARIO BUCCICONE,
by: John E. Jackson
his Attorney.

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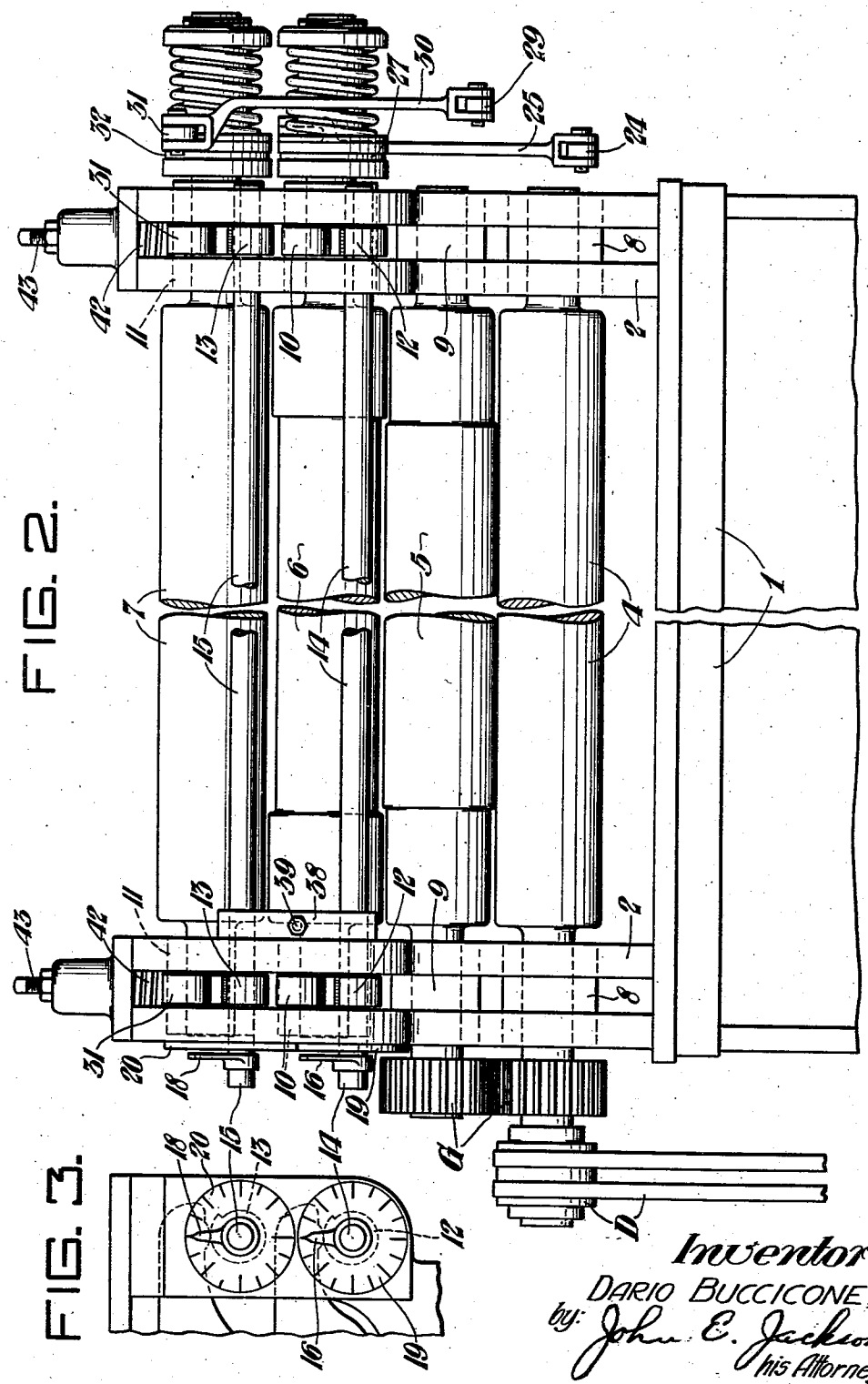


FIG. 2.

FIG. 3.

Inventor:
DARIO BUCCICONE,
by: John E. Jackson
his Attorney.

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SHEET GAUGING AND SORTING MECHANISM

Dario Buccicone, Gary, Ind.

Application April 17, 1941, Serial No. 389,072

3 Claims. (Cl. 209—88)

This invention is a sheet gauging and sorting machine adapted to handle any sheet material but specifically designed for use with tin plate.

A specific example of the machine is illustrated by the accompanying drawings, in which:

Figure 1 is a side elevation;

Figure 2 is a front elevation; and

Figure 3 is a detail.

More specifically, a base 1 mounts laterally spaced vertical housings 2 having windows 3 in which bearings journal the necks of rolls 4, 5, 6 and 7. The necks of the roll 4 are journaled in bearings 8 that are fixed against downward movement and the necks of the roll 5 are journaled in bearings 9 which float vertically, these bearings 8 and 9 being laterally positioned by the housing parts framing the lower portions of the windows 3. The necks of the rolls 6 and 7 are respectively journaled in levers 10 and 11 which vertically swing in the upper portions of the windows 3 which are here widened to accommodate these levers. The roll 5 is restrained from downward movement by its contact with the roll 4, downward movement of the roll 6 is restrained by cams 12 on which the swinging ends of the levers 10 rest and downward movement of the roll 7 is similarly restrained by cams 13 on which the swinging ends of the levers 11 rest. In all instances the levers are pivoted to the housings 2 at one end, intermediately carry the roll neck bearings and have their swinging end resting upon the cams as described.

The rolls 4 and 5 are rotatably interconnected by gears G designed to remain in mesh upon separation of the rolls 4 and 5 within reasonable limits, and one of the necks of the roll 4 is prolonged and powered by a drive D. Assuming the rotations of the rolls 4 and 5 to be in the direction indicated by the arrows, the sheet S to be gauged is fed between the rolls 4 and 5, this raising the roll 5 which vertically floats by reason of its necks being mounted by the floating bearings 9, the bearings 8 journaling the necks of the roll 4 being fixed against downward movement as described. The distance the roll 5 is lifted depends upon the thickness of the sheet being gauged, it being noted that all portions of the sheet are contacted in transverse as well as longitudinal directions, the distance the roll 5 is lifted being a direct function of the maximum thickness of the sheet.

When the roll 5 is lifted it peripherally engages the roll 6 if the cams 12 are set so that the distance between the peripheries of the rolls 5 and 6 equals or is less than the distance the roll 5 is lifted, or, in other words, equals or is less than the maximum thickness of the sheet being gauged. The roll 6 can float upwardly by reason of its necks being journaled by the upwardly swinging levers 10, and if the thickness between the peripheries of the rolls 5 and 6 as set by the cams 12 is less than the distance the roll 5 is lifted by the sheet, then the roll 6 is also lifted so as to peripherally engage the roll 7 depending upon whether the cams 13 which determine the position of this vertical roll 7 are set so that the roll 7 is sufficiently close to the roll 6.

The cams 12 and 13 are respectively mounted by shafts 14 and 15 journaled by the housings 2 and having projecting ends respectively provided with pointers 16 and 18, these pointers, in turn, respectively playing on dials 19 and 20. These dials are calibrated in terms of thickness or gauge, the dial 19 representing under gauge and the dial 20 over gauge. Assuming the dials to be respectively set for over and under gauge tolerances, the passage of the sheet between the rolls 4 and 5 will result in no frictional drive between the rolls 5 and 6 if the sheet is thinner than the under gauge tolerance, frictional drive will result between the rolls 5 and 6 if the sheet is within the under gauge tolerance or is over gauge, and will result in frictional drive between the rolls 6 and 7 if the sheet exceeds the over gauge tolerance. In each instance the maximum thickness of the sheet is gauged.

Advantage is taken of the above by using the power from the rotation of the rolls 6 and 7 to operate sheet deflectors 21 and 22 arranged at the exit of the rolls 4 and 5, the deflector 21 being carried by a shaft 23 keyed to a lever 24 thrown through a link 25 by a lever 26 powered by the neck of the roll 6 through a friction clutch 27. The deflector 22 is carried by a shaft 28 keyed to a lever 29 thrown through a link 30 by a lever 31 powered by the neck of the roll 7 through a friction clutch 32. The weight of the deflector 21 and its associated levers and link is reacted by an adjustable counterpoise 33 carried by an opposing extension 34 of the lever 24, while the weight of the deflector 22 and its associated levers and link is reacted by an adjustable counterpoise 35 carried by an opposing extension 36 of the lever 29.

When a sheet passed through the rolls 4 and 5 is within the under and over gauge tolerances set by the positions of the cams 12 and 13 with the aid of the pointers and dials associated with

these cams, the roll 6 is frictionally driven by the roll 5 but does not itself frictionally drive the roll 7, this powering the lever 26 through the friction clutch 27 so as to throw the lever 24 through the link 25, this lowering the deflector 21 and allowing the sheet to pass through to a belt conveyer 37a as being within the proper tolerance. However, if the sheet is under the tolerance, it cannot lift the roll 5 high enough for it to frictionally drive the roll 6, this resulting in no movement of the deflector 21 and consequent downward deflection of the sheet as being definitely under gauge, the deflector 21 being gravitationally biased in sheet deflecting position by proper adjustment of the counterpoise 33. On the other hand, if the sheet exceeds the over gauge tolerance it will cause the roll 5 to frictionally drive and lift the roll 6 so that the latter frictionally drives the roll 7, this causing the neck of this roll to power the lever 31 through the friction clutch 32 so as to throw the lever 29 through the link 30 and cause the sheet deflector 22 to be moved downwardly so as to upwardly deflect the sheet to a conveyor 37b as being definitely over gauge. The deflector 22 is gravitationally biased to its non-deflecting position by proper adjustment of the counterpoise 35.

In addition to the details described, it will be noted that the ends of the roll 5 are of reduced diameter to provide open passes between the ends of the rolls 4 and 5, this being so that when the sheet gauged is a sheet of tin plate or the like, the burred edges can pass through these open passes so that the true thickness is gauged. This necessitates the illustrated enlargements of the end diameters of the roll 6 to effect proper peripheral engagement between the rolls 5 and 6. The rolls 4 and 7 are cylindrical throughout and all roll portions are carefully ground to true cylindrical parts. Inadvertent rotation of the shafts 14 and 15 on which the cams 12 and 13 are mounted is prevented by a clamp 38 constituting two halves which engage opposite sides of both shafts, the clamp halves being clamped together by a screw 39 when it is desired to lock the cam shafts.

Compression springs 40 adjusted by screws 41 bear down on the levers 11, and compression springs 42 adjusted by screws 43 bear down on the levers 10, the springs 42 passing through openings in the levers 11 to reach the levers 10. These springs may be adjusted to increase the frictional drive effected when the various rolls peripherally intercontact, but normally this is not necessary. Otherwise, the springs function to prevent violent upward throwing of the rolls 5, 6 and 7 and their associated parts in the event an unusually thick sheet is passed between the rolls 4 and 5 or should a plurality of sheets be inadvertently passed through the machine.

The position to which the deflector 21 is biased by the counterpoise 33 is determined by a screw 44 that engages a stop 45 while the deflecting position of this deflector is determined by a screw 46 that engages this same stop. The same function is provided the deflector 22 by the screw 47, stop 48 and screw 49 which respectively perform the same functions as those of similar parts associated with the deflector 21.

I claim:

1. A gauge including at least three substantially parallel rolls with the middle roll floating between the other two and the latter respectively spaced so that the passage of work equaling or exceeding a predetermined thickness between any two of the rolls causing the middle roll to peripherally engage one or the other of the other two rolls, the roll so peripherally engaged by the floating roll being yieldable from the position effecting its said spaced relation when the floating roll forces against it by reason of the passage of work exceeding said predetermined thickness, and a fourth roll being positioned parallel the roll engaged by the floating roll for peripheral engagement thereby when it yields from its said position, drives being powered by the roll engaged by the floating roll and by the fourth roll, and work sorting means handling work delivered from the gauge being selectively powered by these drives.

2. A sheet gauging machine comprising at least four parallel rolls in vertical alignment, fixed bearings journaling the lowermost one of said rolls, vertically floating bearings journaling the others of said rolls, adjustable means for individually restraining downward movement of the bearings journaling the upper two of said rolls, friction clutches individually connected to said upper two of said rolls and individual power takeoffs for said clutches, the material to be gauged being passed through the two lower ones of said rolls so that the others of said rolls are turned by one another with the number turned depending on the adjustment of said means restraining downward movement of the bearings of said upper two of said rolls.

3. A sheet gauging and sorting machine comprising at least four parallel rolls in vertical alignment, fixed bearings journaling the lowermost one of said rolls, means for rotating said lowermost roll, vertically floating bearings journaling the others of said rolls independently of one another, adjustable means for individually restraining downward movement of the bearings journaling the upper two of said rolls, levers with friction clutches individually connecting said levers to said upper two of said rolls, the material to be gauged being passed through the two lower ones of said rolls so that the others of said rolls are turned by one another with the number turned depending on the adjustment of said means restraining downward movement of the bearings of said upper two of said rolls, a sheet deflecting means powered by said levers to deflect sheets from one path to another depending on where one or more of said levers are thrown by rotation of one or both of said upper two rolls.

DARIO BUCCICONE.