Dec. 27, 1932. J. W. STEELE ET AL 1,892,591

SHEET JOGGING AND REGISTERING MACHINE

Original Filed Oct. 30, 1929

FIG. 1.

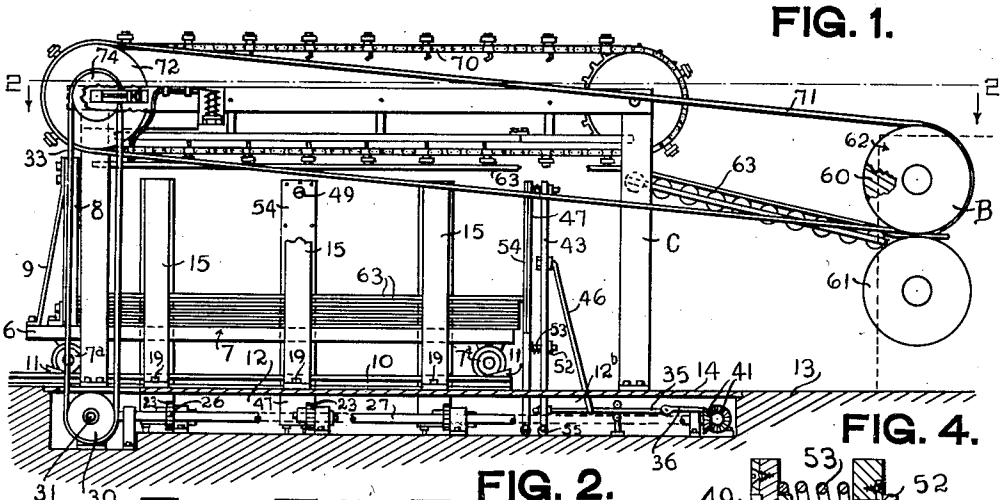


FIG. 2.

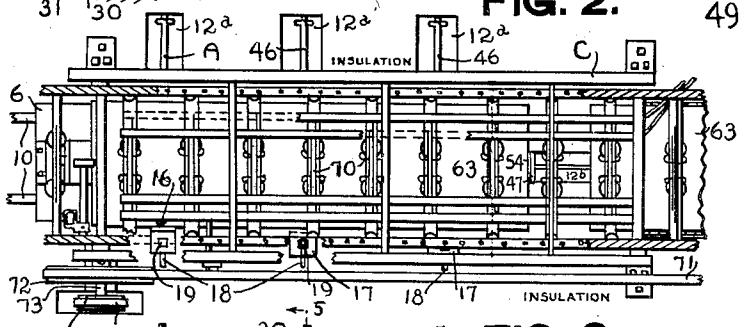


FIG. 3.

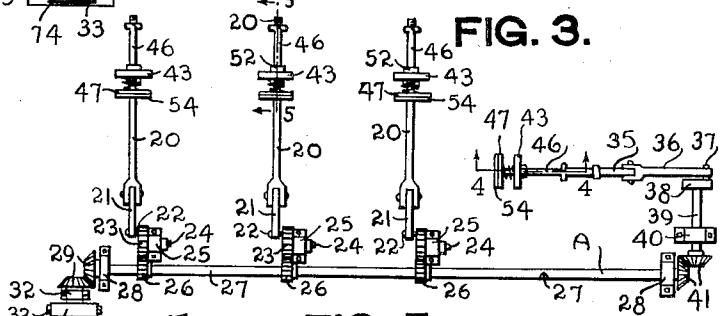


FIG. 4.

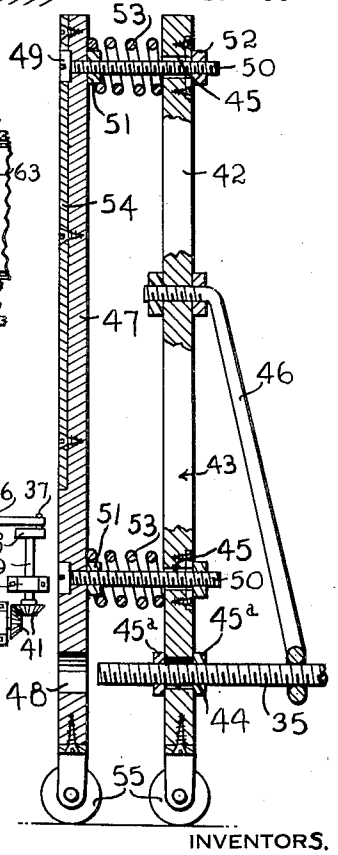
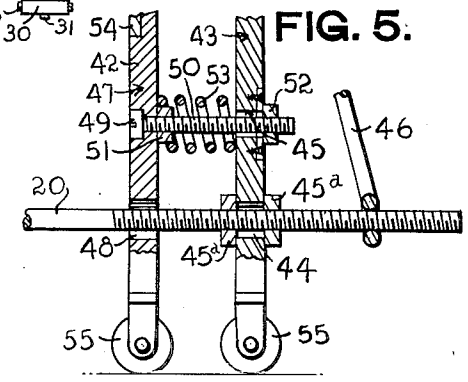


FIG. 5.



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SHEET JOGGING AND REGISTERING MACHINE

Original application filed October 30, 1929, Serial No. 403,642. Divided and this application filed October 26, 1931. Serial No. 571,254.

The present invention relates to material handling apparatus and more particularly to a jogging and registering machine, and is a divisional application of our co-pending application, Serial Number 403,642, filed October 30, 1929.

An object of the present invention is to provide a machine of this kind for jogging sheets of material, such as metal and the like, into registered relation as they come from delivery rolls, delivery machines, conveyors or the like.

Another object is to provide an improved sheet jogging and registering machine which will jog sheets of material such as metal into registered relation, without causing the edges of the sheets to become turned or the sheets to buckle.

Still another object is to provide an improved machine of this kind which is adjustable to various size sheets of material.

Another object is to provide means for receiving the sheets of the material in registered relation and conveying the stack of sheets, as a unit, to the location for the next operation upon the sheets.

Another object is to provide a machine, which in connection with an automatic sheet delivery mechanism, with which it is connected, will do the work of a number of workmen in stacking the sheets in proper registry and in timed relation to the delivery mechanism, without the necessity of any individual adjustment or control on the part of the operator, other than initial adjustment to the size of the sheets and removal of the registered stack of sheets.

Other objects and advantages will be apparent during the course of the following detailed description taken in connection with the accompanying drawing forming a part of this specification and in which drawing:—

Figure 1 is a side elevation of the improved jogging and registering machine, as operated in connection with a sheet delivery mechanism which in turn is applied to the delivery rolls of a cold roll mill, certain parts being broken away for the sake of clearness.

Figure 2 is a top plan view, on the line 2—2 of Figure 1, disclosing the improved jogging and registering machine in position below the sheet delivery mechanism.

Figure 3 is a detail plan view of the improved sheet jogging and registering machine.

Figure 4 is a view partly in section on the line 4—4 of Figure 3.

Figure 5 is a sectional view on the line 5—5 of Figure 3.

In the accompanying drawing forming a part of this specification and wherein similar reference characters designate corresponding parts thruout the several views, the letter A may generally designate the improved sheet jogging and registering machine, the letter B a rolling mill and the letter C a sheet delivery mechanism.

The improved sheet jogging and registering machine A includes a movable platform 6 which may comprise a truck having a bed 7 which is preferably of less width than the sheets to be stacked, mounted upon flanged wheels 7^a and provided with an upstanding abutment 8 arranged at one end of the truck and this abutment may be braced as at 9. The truck may be mounted upon rails 10 which of course prevent lateral movement of the truck while suitable removable wedges 11 or the like are ordinarily provided to engage the wheels and rails as shown in Figure 1 and prevent opposite movement of the truck except when such movement is desired.

Since it is desired to place the greater part of the reciprocating means for the machine out of the way, a housing may be provided below the platform and in the example shown this housing is made up of the walls of a recess 12 in the floor 13 of the structure housing the machine. This recess may be partly covered over by a plate 14 but certain portions of the recess, later described are preferably uncovered.

Arranged at one side of the platform 6 are upstanding side abutments 15 preferably comprising elongated L-shaped plates with the faces 16 of each facing the platform and the bases 17 of each in contact with the plate 14. The bases 17 are each provided with a bolt hole while the adjacent plate 14 is slotted as at 18 so that bolts 19 inserted into

the bolt holes and the slot and suitably secured as with nuts will prevent movement of these abutments 15.

The reciprocating means includes pull rods 20 extending transversely of the mechanism and within the recess 12. They preferably extend beneath the platform 6 and into open positions of the recess, to one side of the platform, designated as 12^a. The free ends of the pull rods 20 are preferably screw threaded and it is these ends which extend into that part of the recess 12 designated as 12^a. The opposite ends of the pull rods are pivotally connected by links 21 to eccentric pins 22 eccentrically carried by gear wheels 23 mounted upon shafts 24 disposed in suitable supports 25. The gear wheels 23 mesh with pinions 26 which are carried by a shaft 27 disposed in suitable supports 28. The shaft extends lengthwise of the jogging mechanism along the adjacent side thereof and, at preferably the rear or abutment end of the mechanism, is connected by bevel gears 29 with a drive pulley 30 having a suitable shaft 31 and bearing 32. This pulley 30 may be connected by a belt 33 to suitable means carried by the sheet delivering mechanism C. However, it is apparent that the jogging and registering machine may be actuated by means other than that described as for example by a prime mover (not shown) connected directly to the pulley 30 by the belt 33 or by a prime mover (not shown) in place of the pulley 30.

The reciprocating means further includes a push rod 35 extending longitudinally of the jogging mechanism and within the recess 12. It extends beneath the platform 6 and into an open portion of the recess 12, to one side of an end of the platform, designated as 12^b. The free end of the push rod 35 is preferably screw threaded and it is this end which extends into that part of the recess 12 designated as 12^b. The opposite end of the push rod is suitably connected by a link 36 and by an eccentric pin 37 to a disc 38 on which the pin is eccentrically mounted. The disc 38 is carried by a shaft 39 having a suitable bearing 40 and connected by suitable gears 41 to the shaft 27. Thus it will be seen that all of the pull rods 20 and the push rod 35 are reciprocated by the rotation of the shaft 27.

Pushers 42 are connected to each pull rod 20 and to the push rod 35. Each of these pushers 42 includes a preferably elongated and upstanding back plate 43 provided with a rod accommodating opening 44 adjacent its lower end and preferably on its vertical medial line. Guide shank openings 45 are provided in the back plate preferably above the opening 44 and adjacent the upper end of the back plate. The rod opening 44 accommodates the screw threaded end of either a pull rod 20 or a push rod 35 which may be adjusted horizontally with respect to the back plate by nuts 45^a placed on the rod and at either side of the back plate, abutting the same. Thus a push or a pull rod can be rigidly connected to each back plate, but the back plate may be adjusted along the rods as is obvious. A brace 46 having one end encircling a push or pull rod, as the case may be, and the other end rigidly attached to the back plate aids in bracing the back plate but permits the brace to slide along a rod when the back plate is being adjusted.

Yieldably connected to each plate is another portion of the pushers. This includes a preferably elongated and upstanding jogger or front plate 47 of substantially the same size as the back plate and provided with a rod accommodating opening 48 adjacent its lower end aligning with the rod opening 44 in each of the back plates 43 but preferably somewhat larger. Bolt heads 49 are set into the surface of each jogger with the shanks 50 thereof projecting thru the jogger and extending beyond the back thereof. The bolts are secured rigidly to the jogger by nuts 51 screw threaded upon the shanks and in abutment with the back of the jogger. The shanks 50 extending thru the guide shank openings 45 of the back plates 43 have their free end provided with means for limiting movement of the joggers away from the back plates. This means may be a nut 52 or the like screwed upon the free end of each shank 50. A coil spring 53 encircles each shank 50 with its end abutting a face of the jogger and the back plate, urging them apart. All of the joggers are provided with wear plates 54 which are of relatively hard material so as to take care of wear upon the outer face of the joggers. Both the joggers and the back plates are preferably mounted upon rollers 55 which roll upon the floor of the recess to facilitate horizontal reciprocation of the pushers.

In the case of each pull rod 20, its free end is adapted to pass thru the opening 48 of a jogger 47 then thru the opening 44 of a back plate 43 and terminate beyond the back of the back plate as shown in Figure 5. Thus the pull rod may be said to pull the stacker toward the platform 6.

As for the push rod 35, its free end is first passed thru the opening 44 of the back plate 43 and is adapted, when the back plate and jogger move toward each other, to pass thru the opening 48 in the jogger 47 as shown in Figure 4. Thus the push rod may be said to push its stacker toward the platform 6.

As an example, B may include a rolling mill provided with upper and lower delivery rolls 60 and 61 and a pulley 62 attached to the upper roll. Sheets 63 of metal or the like are rolled out between the rollers.

As for the delivery mechanism C, an example thereof is fully described in our aforementioned co-pending application. Included in its construction are means generally

shown at 70 in the accompanying drawing, for catching, for example, the sheets 63 of metal as they come from the rolls 60 and 61 and transporting them to a position over the platform 6 and then dropping them upon the platform, one upon the other. The delivery mechanism is preferably operated by the rotation of the rolls 60 and 61 by means of a belt 71 passing over a pulley 72 mounted upon the driving shaft 73 of the delivery mechanism C. An auxiliary pulley 74 also mounted on the shaft 73 may be provided and carry the belt 33 which is in turn carried by the pulley 30 of the jogging and registering machine.

In the operation of the improved jogging and registering machine, adjustment may be made for various size sheets since movement of the truck to the right or left will take care of different lengths of sheets. When the truck is moved into the correct position below the delivery mechanism C, so that as the latter drops the sheets, one end thereof will just clear the abutment 8 mounted upon the truck, the truck may be held against movement by the rails 10 and the wedges 11 as heretofore brought out. However, it should be noted that by adjustment of the nuts 45ª screwed upon the push rod 35, the pusher attached to the push rod and on the opposite side of the platform 6 from the abutment 8, may be moved toward or from the platform so as to also take care of different lengths of sheets.

The widths of various sheets are also provided for by the controlled movement of the side abutments 15 toward or away from the platform 6 by means of the slots 18 and bolts 19 so that the sheets will just clear the abutment, as is obvious. In addition, the pushers connected to the pull rods 20 may be adjusted toward or away from the platform as described in connection with the adjustment of the push rod 35 and its pusher.

As the sheets drop upon the platform the pushers move toward the platform from one side and end and engage a side and an end of the edge of each sheet. The pushers connected to the pull rods 20 jog the sheets against the abutments 15 which are of course at this time rigidly secured at their bases while the pusher connected with the push rod 35 jogs the sheets against the abutment 8. The pushers are operated at a relatively low speed and timed so as not to interfere with the falling of the sheets but to come into engagement with the edges of the sheets subsequent to their dropping upon the stack.

The yieldable joggers engage the edges of the sheets at their wear plates and because they are yieldable, they do not bend the edges of the sheets or cause buckling and they also tend to prevent injury to the jogging mechanism as a whole.

Thus it will be seen that the sheets will register one with the other and when a full stack of sheets is in register, the wedges may be withdrawn and the truck load of sheets rolled to the location of the next operation, for example.

It is obvious that various changes and modifications may be made to the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims:

What is claimed is:

1. In a sheet jogging and registering machine, a platform, abutments arranged at one side and one end of said platform, an elongate yieldable stacker arranged at an end of said platform opposite one of said abutments, an elongate yieldable stacker arranged at a side of said platform opposite one of said abutments, both of said stackers provided with means at the lower end thereof for rolling over a substantially level surface so that said stackers will travel at all times in the same horizontal plane and reciprocating means imparting lateral reciprocation of said first stacker with respect to said machine and longitudinal reciprocation of said second stacker with respect to said machine, said stackers engaging sheets and jogging them against said abutments and into side and end registry one with the other.

2. In a sheet jogging and registering machine, a platform, upstanding abutments at one end and one side of said platform, reciprocating means disposed below said platform, and reciprocating stackers connected to said reciprocating means and arranged along a side and an end of said platform opposite said first mentioned side and end, each of said stackers including an upstanding back plate reciprocable horizontally by said reciprocating means, an upstanding jogger, means slidably connecting the jogger to the back plate and means normally urging the jogger away from its back plate, each of said joggers arranged between its associated back plate and the edge portion of sheets whereby the joggers engage the sheets and jogs the same into registering position against said abutments.

3. In a sheet jogging and registering machine, a platform, abutments arranged at one side and one end of said platform, reciprocating means disposed below said platform, a back plate rigidly connected to said reciprocating means for reciprocation horizontally thereby, a sheet pushing jogger yieldably connected to said back plate and paralleling the same for movement toward and away from said back plate, and means limiting movement of said jogger away from said back plate, said back plate and jogger

arranged along a side of said platform and opposite one of said abutments with said jogger nearest said platform, whereby the jogger engages sheets upon reciprocation of said back plate and jogger and jogs the sheets into registering position against the opposite abutment.

4. In a sheet jogging and registering machine, a platform, abutments arranged at one side and one end of said platform, a yieldable end pusher and a yieldable side pusher arranged at the end and side respectively of said platform opposite to said abutments, each pusher comprising a back plate and a jogger yieldable connected therewith, reciprocating means including a push rod upon which a jogger is slidable, said push rod secured to a back plate for moving the back plate horizontally towards its associated jogger and a pull rod upon which the other jogger is slidable, said pull rod secured to the other back plate for moving the back plate horizontally towards its associated jogger, the joggers of said pushers adapted to engage the edges of sheets and jog the sheets against said abutments and into registry one with the other.

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