April 28, 1942. N. D. MITCHELL 2,280,963

GATHERING MACHINE

Filed Aug. 23, 1941 2 Sheets-Sheet 1

Fig. 1

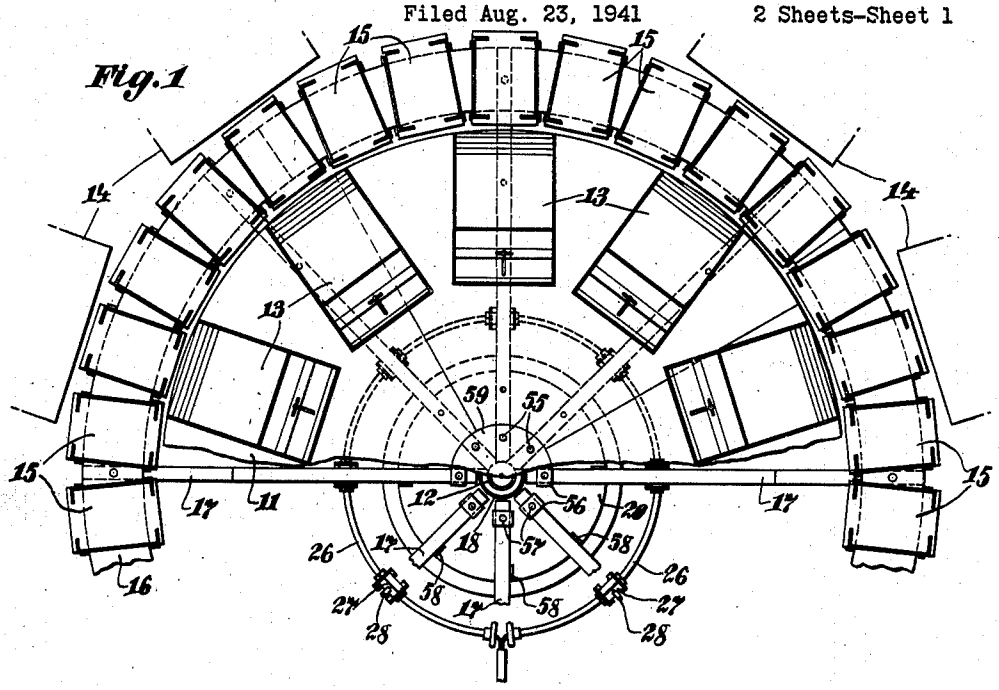
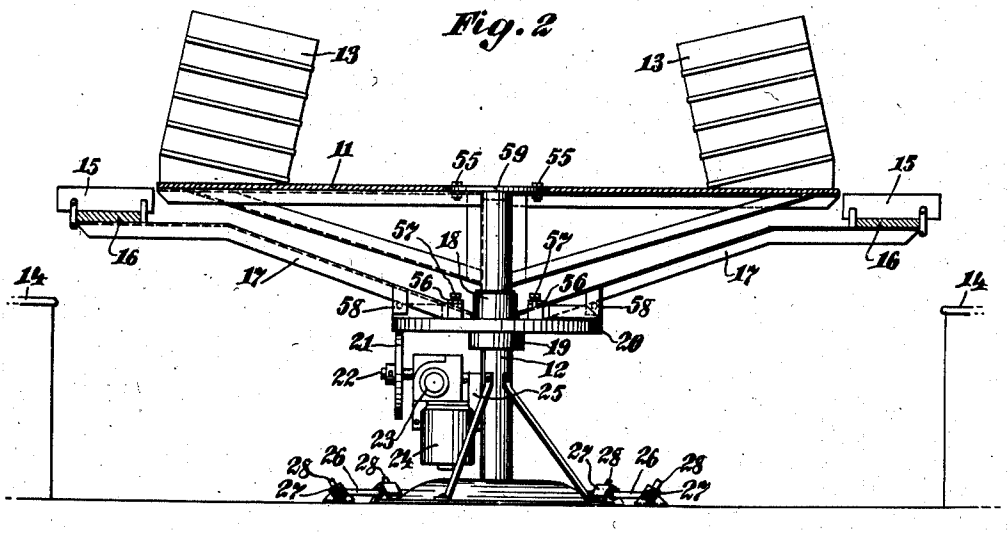


Fig. 2



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Fig. 3

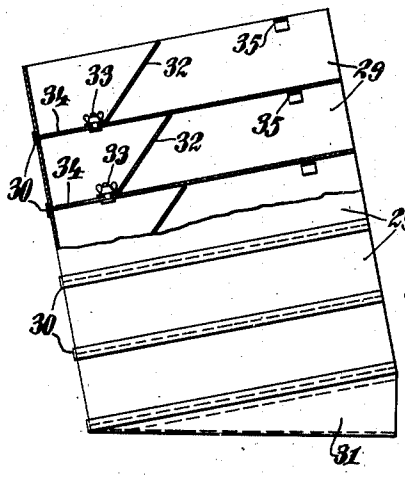


Fig. 4

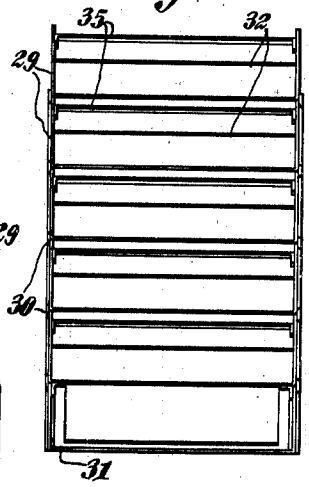


Fig. 5

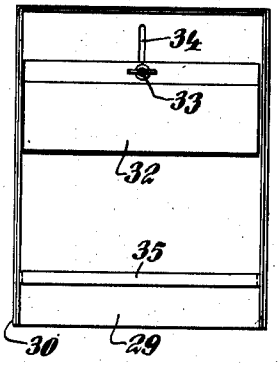


Fig. 6

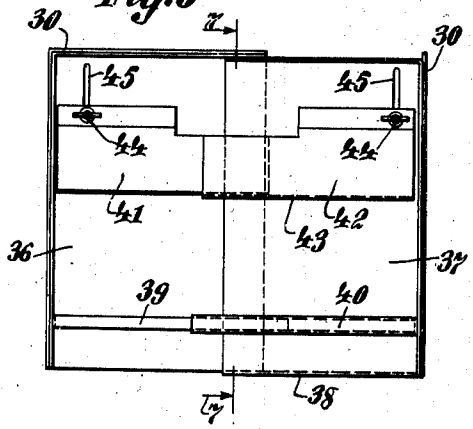


Fig. 7

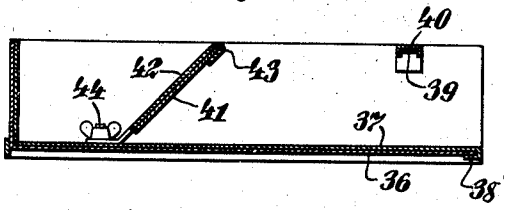


Fig. 10

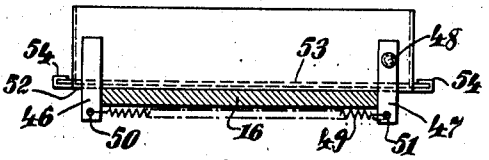


Fig. 8

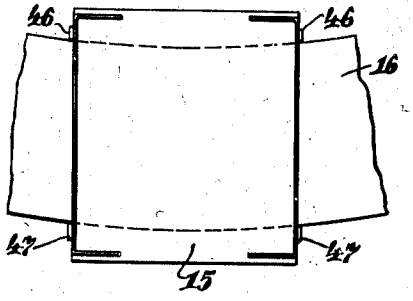
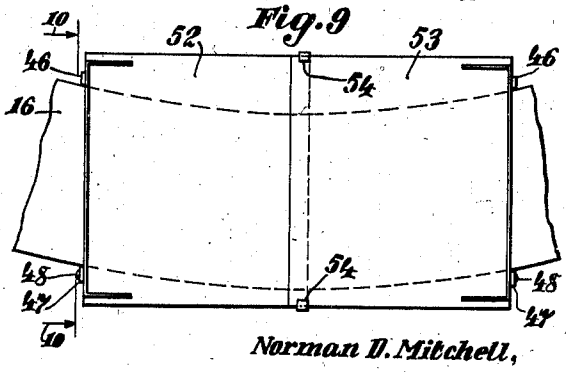


Fig. 9



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UNITED STATES PATENT OFFICE

2,280,963

GATHERING MACHINE

Norman D. Mitchell, Park Ridge, Ill.

Application August 23, 1941, Serial No. 408,039

12 Claims. (Cl. 270—58)

The invention here disclosed relates to the gathering of sheets, signatures, book sections and the like.

Special objects of the invention are to provide apparatus of simple, practical form, which may be adapted to and used for the variety of gathering purposes ordinarily encountered in a book assembling establishment.

Other desirable objects and the novel features of invention by which all objects are accomplished will appear and are definitely set forth in the following specification.

The drawings accompanying and forming part of the specification illustrate one of the practical embodiments of the invention. Structure, however, may be modified and changed as regards this particular illustration, all within the true spirit and broad scope of the invention as hereinafter defined and claimed.

Figure 1 is a broken plan view, with parts appearing in section, of one commercial form of the gathering machine.

Figure 2 is a substantially central cross sectional view of the apparatus.

Figure 3 is a broken part sectional view of one of the sheet holding cabinets.

Figure 4 is a front view of the same.

Figure 5 is a plan view.

Figures 6 and 7 are plan and sectional views respectively of an adjustable form of tray or cabinet section, Figure 7 being taken as on the line 7—7 of Figure 6.

Figure 8 is a plan view of one of the collecting or receiving trays, the annular rotating carrier for the trays being shown broken away at opposite sides of the tray.

Figure 9 is a similar view of an adjustable form of collecting tray.

Figure 10 is a sectional view as on line 10—10 of Figure 9.

In the present invention the supply sheets are mounted on a central table and these are withdrawn by operators stationed about the table and dropped into collecting trays rotating between the operators and the central supply source.

In Figures 1 and 2 the central supply table is designated 11 and it is shown as substantially circular and supported in stationary relation by a central pedestal 12.

Sheet supply cabinets are shown at 13 removably mounted in a circular series on the table.

Operator stations are indicated at 14, about the table, opposite the supply cabinets 13.

The gathering or collecting trays are indicated at 15, removably and adjustably mounted on a rotating annular support 16, about the rim of the table and carried by radial arms 17 projecting from a hub 18 riding on an annular shoulder 19 on the central pedestal 12.

The hub 18 of the rotating carrier is shown as having an outstanding flange 20, forming a friction disc engaged by friction drive wheel 21.

For purposes of speed adjustment, the friction drive wheel 21 is shown as adjustably mounted on shaft 22, the latter operated through reduction gearing 23 from motor 24. The motor and reduction gear unit are shown as carried by bracket 25 mounted on the table pedestal below the friction disc 20.

To enable operators to exercise a proper degree of control over the machine there is provided in the illustration an annular conduit 26, on the floor, about the base of the pedestal, carrying the wiring for the motor and having interposed in it, switch boxes 27 substantially opposite the operator stations and having switch buttons 28 within foot reach of operators at the individual stations.

In Figures 3, 4 and 5, the cabinets are shown as made up of tray sections 29 having flanged bases 30, by which they may be removably stacked one on top of the other and an incline or wedge support 31 engageable beneath the bottom section to support the stack in a rearwardly or inwardly inclined relation.

Forwardly inclined back drops are shown at 32 adjustably secured by screw fastenings 33 extending through slots 34 in the bottoms of the trays.

The sides of the supply trays 29 are shown connected near the front by cross braces 35.

Constructed as described, the trays can be made of relatively light sheet metal.

Some or all of the trays which make up the cabinets can be adjustable in size, after the manner illustrated in Figures 6 and 7, where the tray bottoms are made up in oversliding sections 36, 37, one carrying an inturned channel 38 at the front edge slidingly engaged over the forward edge of the other section. Similarly, the cross brace is shown as made up of telescopically engaged sections 39, 40.

Also in this adjustable form the back stop is made up of oversliding or telescopically connected sections 41, 42, the latter having an inturned channel 43 at the top slidingly engaged over the upper edge of the other section. Each of the latter sections are shown adjustably se-

cured by screw fastenings 44 adjustable in slots 45 in the bottom sections.

Similarly, the collecting trays may be of fixed dimension, or adjustable to hold different size sheets, as illustrated in Figure 8 and Figures 9 and 10.

In both instances they may be adjustably and removably engaged on the annular support 16 by dependent fixed brackets 46 at the back, engaging down over the inner edge of the annular support and clamping brackets 47 pivoted on the sides of the boxes or trays at 48 and yieldingly gripped against the outer edge of the annular support by spring connections 49 caught to the lower ends of the fixed brackets at 50 and removably hooked to the swinging brackets at 51.

The extensible form of receiving tray, Figures 9 and 10, is shown as made up of two bottom sections 52, 53, slidably engaged one over the other and retained so by hook lugs 54 at the rear and forward edges of one section slidably engaged over the corresponding edges of the other section.

The supply cabinets may be built up in any number of tiers according to the number of sheets, signatures or sections to be taken by each operator and these cabinets may be placed on the table according to the number of operators employed.

The operator stations may be simply seats or rests for the operators.

The number and spacing of the collecting trays on the annular carrier may be varied to meet the special requirements of the work.

In the illustration the cabinets have five trays or compartments. Each operator, therefore, will have the duty of withdrawing, in proper order, five sheets or signatures and depositing those within the tray which is passing at the time. For each revolution of the carrier, therefore, each tray will receive a complete set of sheets, signatures or the like. Extra space may be left between the first and the last cabinets of the series for convenient access of an unloading operator to remove the collected books or sections from the trays as they reach such point.

Where the work requires that a book be gathered in sections, after the several sections have been accumulated, each section as above described, the cabinets may be removed and the sections of each order be stacked on the table in front of the several operators who are to assemble the sections and who then withdraw the sections from the stacks in front of them, depositing them in the trays, as they reach each station.

In case of an operator missing a sheet or a section, the power can be thrown off to stop or to slow the machine until the error can be corrected, by the operator simply actuating the switch button 28 in front of him or her.

These switches may be of the normally closed type, connected all in series so that the throwing of any one switch will momentarily interrupt the power or control circuit.

By providing colored or distinctive divider sheets at the first or last station, the unloading operator need not remove the gathered sheets from each tray as it passes the unloading station and may remove the gathered units when more convenient to do so.

For convenience of storing, when the machine is not actually in service, the stationary table and the rotating tray carrier may be made in separable sections or segments; thus the table may be made in four sections, detachably bolted at 55 to a central disc or head 59 at the top of the pedestal. Similarly, the ring or annular portion 16 of the carrier may be made in separable sections and the radial arms 17 be detachably secured on top of the friction disc 20 by having their inner ends extended in under arches 56 on the disc and clamped by bolts 57, said arms having fulcrum pieces 58 bearing on top of said disc.

The complete adaptability of the machine to meet various requirements is of special advantage. The cabinets may be built up in any number of sections, according to the number of sheets to be taken by each operator. These cabinets may be spaced on the table, according to the number of operators and being freely movable they can be set to suit the convenience of each operator. When assembling the sections of a book, or in other special cases, the cabinets may be entirely removed and the supplies stacked directly on the table or in special holders which may be placed on the table.

The back stops of the cabinet sections can be adjusted to set the sheets forward within convenient reach of the operators. The adjustability of these cabinet sections enables the handling of any size sheets. The number of gathering trays and their location on the carrier ring 16 may be determined to best meet the requirements of the job in hand. By using the adjustable form of collecting trays, sheets of any size can be collected and held in registered relation. The spring closed adjustable form of clamps serve to firmly grip the trays, either the fixed or adjustable type, on the carrier ring and by unhooking the springs at 51 these clamps can be quickly opened up to permit removal or adjustment of the trays.

The adjustable friction drive enables rotation of the collecting trays to be set at the best speed for any particular case. While the friction drive illustrated is satisfactory, various other forms of drive may be employed and change in speed may be provided for by a suitable variable speed gear set interposed between the motor and final drive.

The operators withdraw the sheets from a stationary support directly in front of them and the movements of the hands are substantially vertical so that the work is not tiring and rapid gathering is easily attained. The collecting trays are the only moving parts of the apparatus and these are below the table, within convenient reach of the hands but out of the direct range of vision so as to have no tiring or confusing effect upon the operators.

The power requirements are relatively light, for the work accomplished, since the heavier parts, the table with its load of supply sheets is stationary, and the collecting trays, the moving part, can be carried by a relatively light skeleton form of spider construction.

The collecting or collating action being effected by substantially vertical movements, any need for hand-jogging of the sheets is practically eliminated.

What is claimed is:

1. In a gathering machine, the combination of a stationary, substantially circular table, supply cabinets removably and adjustably mounted on said table, operator stations about said table, opposite said supply cabinets and a ring of removably and adjustably mounted collecting trays ro-

tatably mounted below said table, in between said cabinets and operator stations.

2. In a gathering machine, the combination of a stationary, substantially circular table, supply cabinets on said table, operator stations about said table, opposite said supply cabinets, a ring of collecting trays rotatably mounted below said table, in between said cabinets and operator stations and means for rotating said trays past said operator stations including a motor, a friction wheel operated by said motor and a friction disc engaged by said friction wheel and connected with said ring of rotatably mounted trays.

3. In a gathering machine, the combination of a stationary, substantially circular table, a central supporting pedestal for said table, supply cabinets on said table, operator stations about said table, opposite said supply cabinets, a ring of collecting trays rotatably mounted on said central supporting pedestal below said table, in between said cabinets and operator stations, means for rotating said trays past said operator stations and controls for said rotating means located at said operator stations and disposed in a ring about the base of said central supporting pedestal.

4. In a gathering machine, the combination of a stationary, substantially circular table, supply cabinets on said table, operator stations about said table, opposite said supply cabinets, a ring of collecting trays rotatably mounted below said table, in between said cabinets and operator stations, a central, supporting pedestal for said table and said ring of collecting trays having a central hub journaled on said pedestal below said table.

5. In a gathering machine, the combination of a stationary, substantially circular table, supply cabinets on said table, operator stations about said table, opposite said supply cabinets, a ring of collecting trays rotatably mounted below said table, in between said cabinets and operator stations, means for rotating said trays past said operator stations and a ring of controls for said rotating means, below said table and with individual controls in line with said operator stations, said means for rotating said trays including an electric motor and said ring of controls including an annular length of conduit with motor controlled foot operable switches interposed therein.

6. A gathering machine comprising a central, substantially circular, stationary table, a central supporting pedestal for said table, an annular series of collecting trays having a central hub rotatably mounted on said pedestal and thereby rotatably supported in concentric relation, below said table, operator stations about said annular series of trays and means for rotating said trays past said operator stations, including a motor mounted on the central supporting pedestal below said hub and driving connections from said motor to said hub.

7. A gathering machine comprising a central stationary table, a ring of collecting trays rotating about said table and supply cabinets on said table in front of said collecting trays and adjustable in width to accommodate sheets of different width.

8. A gathering machine comprising a central table, a ring of collecting trays about said table, and supply cabinets on said table in front of said collecting trays and including inwardly inclined supporting shelves and adjustable back stops at the inner ends of said supporting shelves.

9. A gathering machine comprising a central supply table, an annular support about said supply table and collecting trays removably and adjustably secured on said annular support.

10. A gathering machine comprising a central supply table, an annular support about said supply table and collecting trays removably and adjustably secured on said annular support, said collecting trays comprising telescopically extensible sections and said securing means being carried by said extensible sections to hold said trays in place on the annular support irrespective of extensible adjustments of the same.

11. A gathering machine comprising a sectional stationary supply table, a sectional ring of collecting trays rotating about said table and supply cabinets removably engageable on said table.

12. A gathering machine, comprising in combination, a central supporting pedestal, a stationary table mounted on the top of said pedestal, a hub journalled on the pedestal below said stationary table, arms radiating from said hub, an annular support carried by said radiating arms, at the rim of said stationary table, collecting receptacles on said annular support adjacent said rim portion of the table.

NORMAN D. MITCHELL.