Jan. 6, 1953 J. H. TAYLOR 2,624,138

FEEDING AND SPREADING DEVICE

Filed July 12, 1949 2 SHEETS—SHEET 1

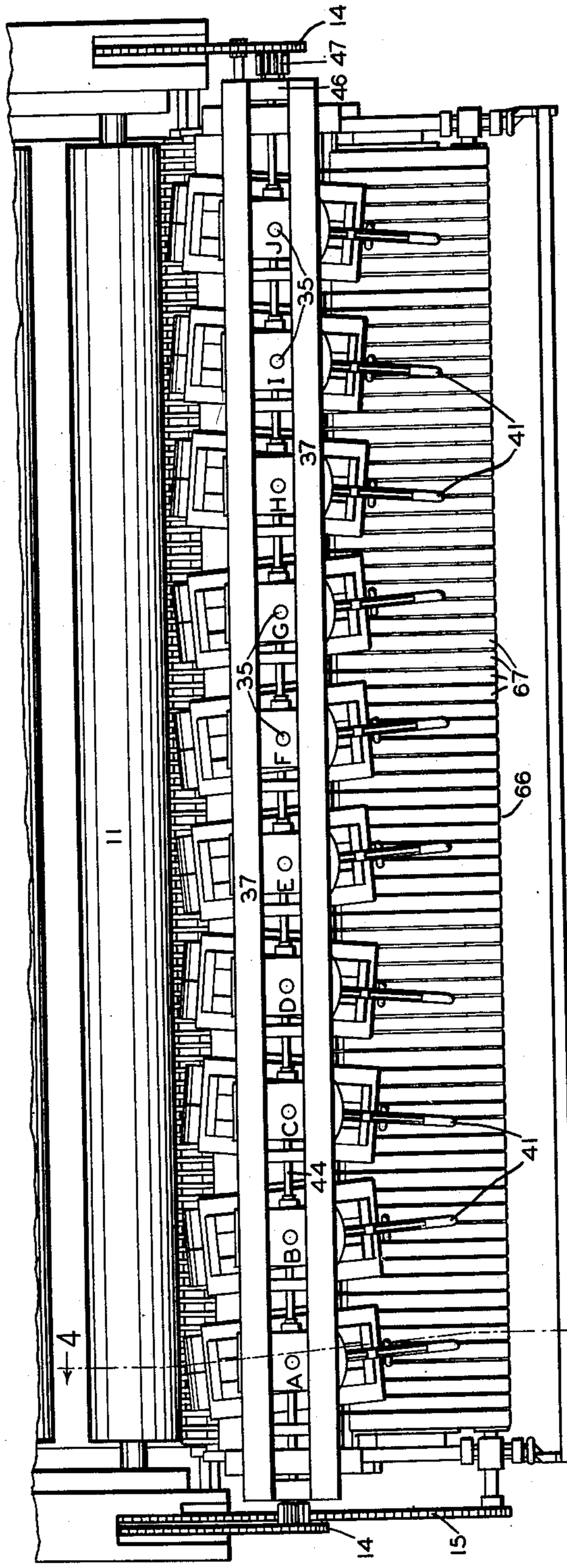

FIG.-1

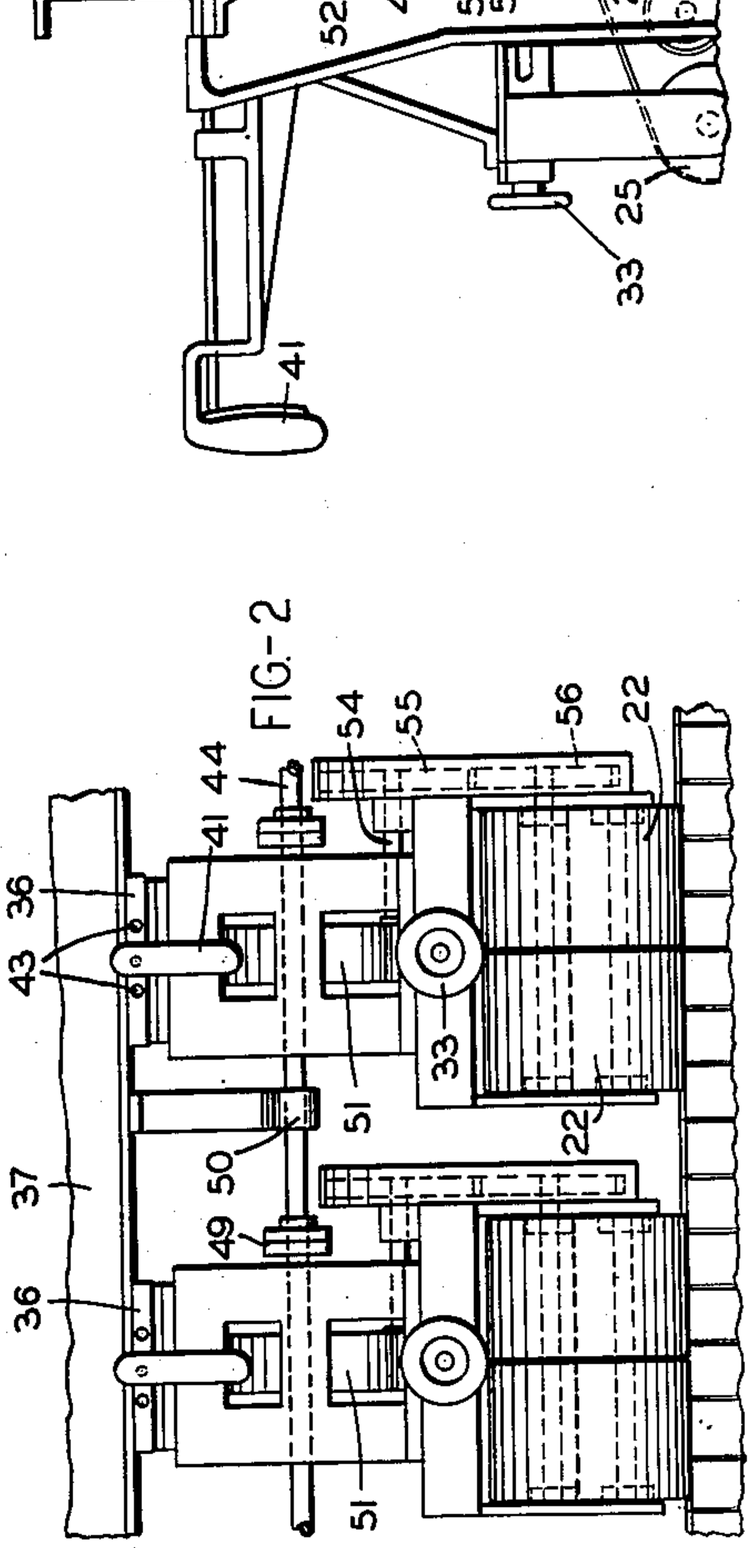

FIG.-3

FIG.-2

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FIG.-4

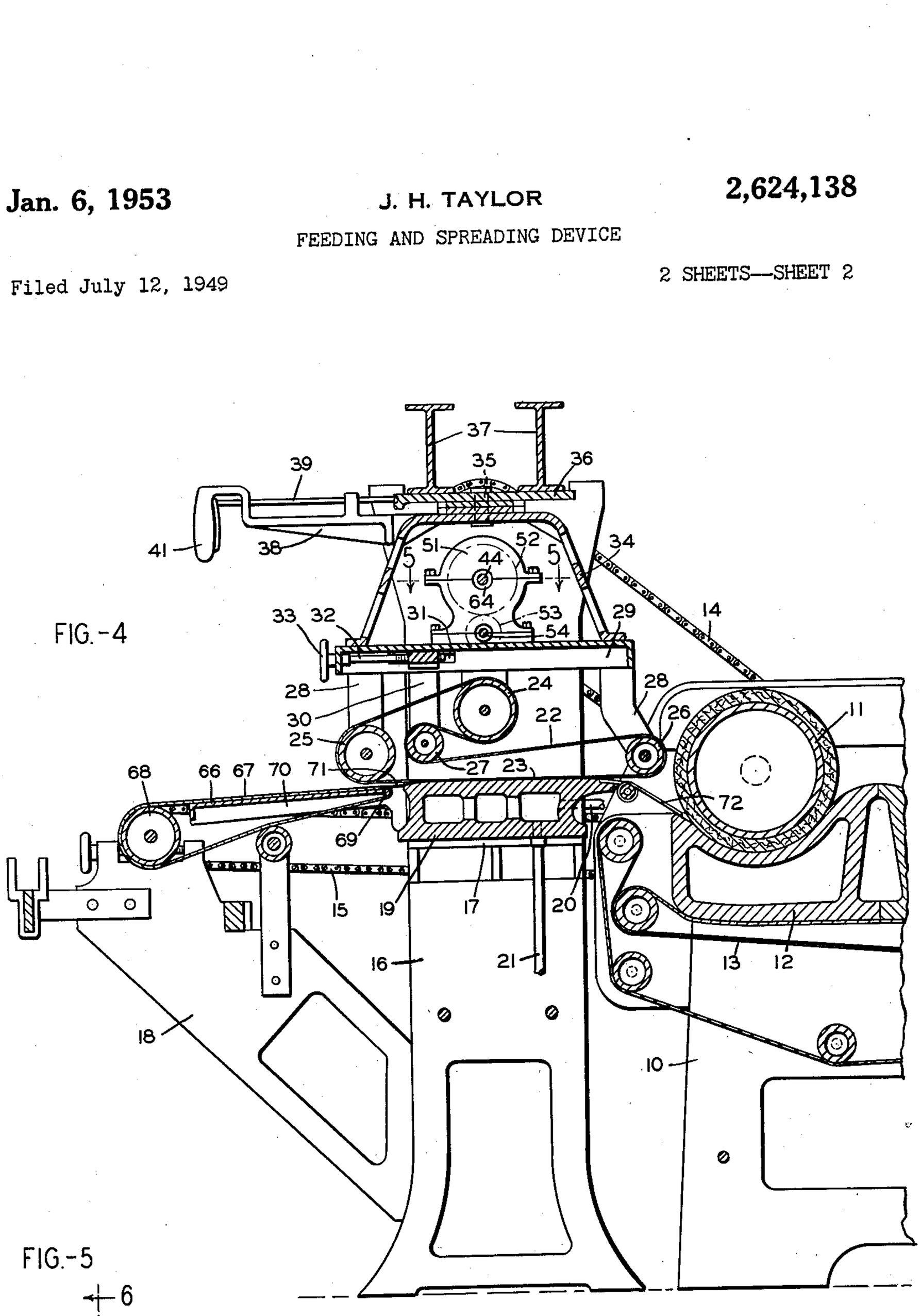
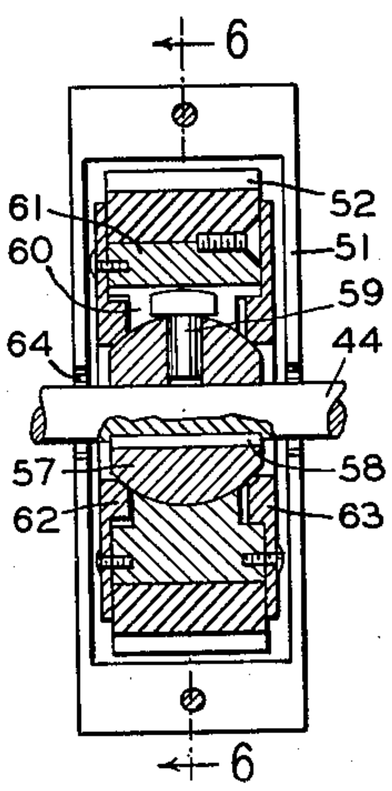


FIG.-5



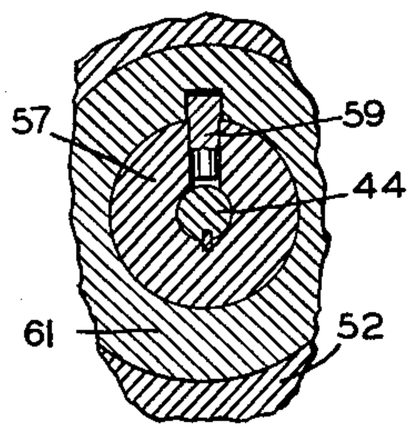


FIG.-6

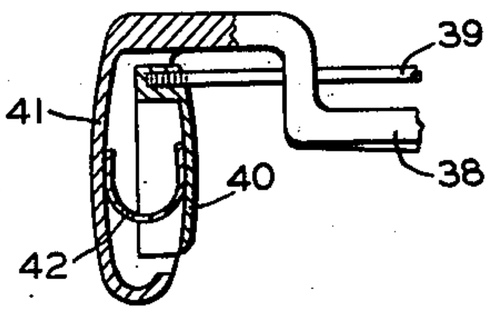


FIG.-7

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UNITED STATES PATENT OFFICE

2,624,138

FEEDING AND SPREADING DEVICE

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11 Claims. (Cl. 38—143)

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This invention relates to universal work feeding and spreading devices for flat work ironers.

Conventional work spreading devices, commonly employed for feeding sheets, table cloths, pillow cases and other flat work to an ironing machine, spread the work laterally in both directions, remove wrinkles and smooth it as it is advanced to the ironing rolls and chest.

One object of the present invention is to provide an improved universal work feeding and spreading device embodying a friction work feeding device mounted so a friction face thereof is in contact and moves with the advancing work, but in which said device and the supporting and driving means therefor are adjustable as a unit to an inclined or askew relation with respect to the general direction of work advance to and through the ironer, and thus are effective to spread it laterally and remove wrinkles.

Another object is to provide variable adjustment for such a unit, thus to increase or diminish the spreading effect or to adapt the unit for spreading either to the right or to the left.

A further object of the present invention is to provide an improved work feeding and spreading device which preliminarily heats the work before it reaches the first ironing roll, thus speeding up the drying and securing somewhat greater production from the ironer.

Another object is to provide improved work feeding and spreading mechanism which is conveniently adjustable to vary the amount or degree of lateral spreading effect, thus to take care of different weights or textures of the work.

Still another object is to provide improved spreading mechanism specially suitable for multiple lane ironing machines and therefore arranged and adapted to smooth the work by lateral divergence or spreading action in each of the several lanes into which the available ironing space is divided.

A further object is to provide improved spreading mechanism capable of adjustment to accommodate it universally to various widths and numbers of lanes in accordance with different setups or arrangements of the lanes in any ironing machine to which the mechanism is connected.

Another object is to provide improved universal work feeding and spreading mechanism consisting of a number of like individually adjustable feeding and spreading units mounted side by side in a row extending across the work feeding area and capable, by suitable adjustment, of being organized into one, two, three or more groups, depending upon the number and width of the lanes into which the ironing space of the ironing machine is to be divided.

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A further object is to provide simple drive mechanism for a series of such work feeding and spreading units.

Further objects of the invention in part are obvious and in part will appear more in detail hereinafter.

In the drawings, which represent one of several suitable embodiments of the invention,

Fig. 1 is a plan view of the spreader and a portion of the work receiving or front end of the ironing machine with which the spreader is associated;

Fig. 2 is a front elevation of two of the work spreading units, the units being set straight ahead for feeding parallel to the length of the ironing machine;

Fig. 3 is a partial right side elevation of the frame and drive mechanism;

Fig. 4 is a sectional elevation on the line **4—4**, Fig. 1;

Fig. 5 is a detail section on the line **5—5**, Fig. 4;

Fig. 6 is a fragmentary section on the line **6—6**, Fig. 5; and

Fig. 7 is a detail sectional view of a part of the adjusting handle.

The work feeding and spreading device of the present invention is capable of use with any style or form of flat work ironer and is here illustrated as associated with a conventional form requiring but brief description. The ironing machine shown includes a suitable frame **10** in which are mounted a series of ironing roll and chest pairs, of which only the first roll **11** and heated chest **12** are shown. At **13** are shown the traveling tapes or aprons, by means of which the work, after it passes the last ironing roll, is moved along the smooth bottom surface of the ironing chest, for final drying, and is then returned to the discharge end of the ironing machine. Endless chains **14**, **15** (later referred to) pass over sprockets (not shown) on the shaft of one of the ironing rolls, or of the drive mechanism therefor, and serve as the drive means for the work feeder and spreader, as will later appear, and thus correlate the two mechanisms to each other.

One important feature of the present invention is the use or employment of one or more work spreading and feeding units each including one or more friction drive devices and supporting and driving means therefor, each device having a friction face or surface which is applied with pressure to the upper or lower surface of the advancing work, and which unit is capable of adjustment

so that the said friction driving surface travels at an askew or inclined relation with relation to the general line of advance of the work to the ironing machine. The degree of inclination is variable. Thus any unit, so inclined, produces lateral spreading action upon work being fed, and two or more, placed half on one side and half on the other side of the longitudinal center line of the work, will remove wrinkles and smooth out the fabric.

While the invention may be applied to a friction device located below and supporting the traveling work, I prefer to apply it to devices lying above the work and pressing down upon it. In such case the work may be supported by belts beneath it as in Couch Patent 2,110,437 granted March 8, 1938.

The work feeding and spreading mechanism of the machine shown includes a suitable stand or frame **16** provided with brackets **17**, **18**, on the first of which is mounted a hollow steam heated chest **19** provided with steam supply and drain pipes **20**, **21**. Work to be ironed is fed to the ironer by travel across the smooth upper surface of said chest, which therefore preliminarily heats the work and prepares it for ironing, thus reducing the ironing period, by speeding up the drying, and increasing the capacity of the ironing machine.

The work feeding and spreading devices here include a series of upper movable friction driving devices, which may be of any suitable form for the purpose, such as friction rollers, but are here shown as endless driving belts **22**, arranged or grouped in unit form, all of which have a lower stretch **23** traveling across and cooperating with the upper polished surface of the heated chest **19**. The several units are arranged in side by side relation in a row extending across or at right angles to the general direction of advance of the work to and through the ironing machine. Since all units are alike, description of one will suffice for all.

Each unit, whether it lies above or below the plane of travel of the work, is mounted upon the frame for rotatable adjustment about a vertical axis. In the present machine the units are all suspended from above. As shown each unit includes one or more of the belts **22**, two to each unit in the form shown. Both belts travel in side by side relation over several one piece rollers **24**, **25**, **26** and an adjustable idler or slack takeup roller **27**, rolls **24**, **25**, **26** being mounted for rotation in arms or brackets **28** secured to plate **29**, and roller **27** being mounted in brackets **30** which are adjustable fore and aft in slots **31** of plate **29** by means of screw **32** and hand wheel **33**.

Plate **29** of each unit is attached to an upper unit frame member **34** pivotally suspended, to turn on a vertical axis, at **35**, on bearing plates **36** carried by transverse supporting beams **37** which extend clear across the full width of the spreader. On each frame member **34** is mounted a support **38** in which slides a rod **39** having a grip member **40** lying within a handle **41** attached to support **38**. Rod **39** is biased by spring **42** to advance its outer end into one of a series (three being shown) of recesses **43** in the fixed plate **36**. By grasping the handle and squeezing on the grip the locking rod **39** may be withdrawn from any recess, so that the unit as a whole may be adjusted or turned angularly about said vertical axis, right, left or straight ahead, and then may be locked. Any degree of angularity may be secured by provision of a sufficient number of locking recesses.

The mechanism of each unit may be driven by its own individual drive motor or mechanism of any suitable form. But, to simplify the drive, and still permit angular adjustment of each unit with reference to all others, all units are here driven from a common drive shaft **44** through a series of universal or self aligning gear bearings, one for each unit.

Referring to Figs. 1 and 3, the drive for the unit mechanisms is from the ironer by means of chains **14**, or one such chain. Each chain drives a sprocket **45** journalled in a bracket **46** secured to the main frame **16**. A gear **47** integral with or attached to sprocket **45** drives gear **48** on the end of shaft **44**. This shaft could be a single member, extending the full width of the machine, but for ease of assembly and to permit any unit individually to be taken out and repaired or replaced, the shaft **44** shown is made up of separate lengths or units connected by couplings **49**. Bearings **50** support the shaft between units.

Mounted on plate **29** of each unit is a gear case **51**, housing two meshing gears **52** (Figs. 3 and 5) and **53** (Figs. 3 and 4). A short shaft **54** (Fig. 2) on gear **53** carries a gear **55** which meshes with gear **56** (Fig. 2) on the shaft of drive roll **24** (Fig. 4).

To allow for angular drive between shaft **44** and gear **52**, necessary to angular adjustment of the unit, gear **52** has a spheroidal hub **57** keyed to shaft **44** at **58**. Into a radial hole in this hub is slidably and rotatably fitted a heavy driving key **59**, the head end of which is wide and flattened and fits slidably in a key way or slot **60** in seat section **61** secured to outer gear member **52**. **62** and **63** are retaining plates. Clearance holes **64** in the gear case allow angular movement of the case relative to the shaft **44**.

With this arrangement, shaft **44**, rigidly supported in its bearings **50**, drives gear **52** either straight or at an angle, and through the gear train described drives the endless belts **22**, which are in contact with or are pressed down toward chest **19** and provide the work advancing means.

65 indicates an adjustable chain tightening sprocket for chain **14**.

A feeding table **66** of suitable form is used in front of the spreading device proper, this feeder comprising a set of endless belts **67** supported by driving roll **68**, end roll or rod **69** and plate **70**, the roll **68** being driven from the ironer by sprocket chain **15** before referred to. These parts are supported by brackets **18**.

In operation, the steam chest is heated by steam admitted to its chamber by pipe **20**, with the condensate discharged through pipe **21**. Flat work, such as sheets, table cloths, pillow cases or the like is applied, piece by piece, to the feeding tapes **67**, upon which it is spread out as smoothly as possible by the operator. Each piece is advanced by tapes **67** across the usual fingers **71** into the space between spreading belts **22** and chest **19**. Rollers **25** and **26** are of such size and are so located with reference to bed **19** that when the belt is tight it is applied with some pressure to the upper surface of the bed and thus has a strong frictional grip on work moving with it. In other words, the downward pressure of the belts upon the work creates sufficient friction to cause the work to advance across the polished upper face of chest **19** to and across fingers **72** to the space between the first roll **11** and chest **12**

of the ironing machine. Thus the work is preliminarily heated before the ironing machine begins its ironing operation. The two machines, ironer and spreader, may be so related (by the gear ratio between them) that the rate of travel of the work through the ironer may be slightly faster than through the spreader, thus applying a slight longitudinal stretch to the work as it enters the ironer, and thus assisting in smoothing out transverse wrinkles.

The several units of the spreader, of course, are adjusted individually to produce diverging travel of the right and left halves of each piece of work. These units are used in groups, according to the width of the work pieces, or the number of lanes into which the ironing space is to be divided. Any number of units may be employed in a machine, ten being here illustrated and marked A to J inclusive in Fig. 1. These units may be adjusted for use as a single group when the ironing machine operates with but one lane, as when very wide sheets are being ironed. In that case the five units at the left, A to E inclusive, are adjusted to spread to the left, while the other six, F to J, inclusive, spread to the right.

When more lanes may be employed, as when ironing towels, the groups may contain lesser numbers. There might be two groups of five units each, the center unit of each being set straight ahead, or one group of four and one of six, as shown in Fig. 1, or five groups of two units each, or two groups of four and one of two, etc.

As each article travels across the chest **19**, the belts or groups of belts effective upon it spread it laterally, remove all longitudinal wrinkles and thus smooth it ready for ironing.

Adjustment of the units may be accomplished at any time by releasing the locking rod **39** and turning the unit to the desired degree of angularity. Also, any unit, including its section of shaft **44** may be taken out, repaired and replaced, independently of all others.

Other advantages of the invention will be apparent to those skilled in the art.

What I claim is:

1. Apparatus for spreading and feeding flatwork to an ironing machine, comprising a frame adapted to be mounted adjacent to the feed end of an ironing machine, a heated bed member supported upon said frame opposite the entrance to the said machine and having a smooth flat upper ironing surface, means for advancing pieces of flatwork across said ironing surface and into the pressing space of said machine and for simultaneously spreading each piece laterally right and left from its center line, whereby the flatwork is heated and set while being thus laterally spread.

2. Apparatus for spreading and feeding flatwork to an ironing machine, comprising bed-supporting means disposed adjacent to the feed end of an ironing machine, a heated bed member supported upon said bed-supporting means opposite the entrance to the said machine and having a smooth upper ironing surface, means for advancing pieces of flatwork across said ironing surface and into the pressing space of said machine, comprising a frame mounted over said bed-supporting means, a feeding device having a planar friction face which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing, and means on the frame supporting said device for adjustment bodily about a vertical axis to a position in which said friction face travels along a path askew with relation to a straight fore and aft line from the spreader through the ironer.

3. Apparatus for spreading and feeding flatwork to an ironing machine, comprising bed-supporting means disposed adjacent to the feed end of an ironing machine, a heated bed member supported upon said bed-supporting means opposite the entrance to the said machine and having a smooth upper ironing surface, means for advancing pieces of flatwork across said ironing surface and into the pressing space of said machine, comprising a frame mounted over said bed-supporting means, a feeding device having a planar friction face which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing, and means on the frame supporting said device for adjustment bodily about a vertical axis to a position in which said friction face travels along a path askew with relation to a straight fore and aft line from the spreader through the ironer, an operating shaft mounted to rotate on a fixed axis in said frame, and driving connections between said shaft and said device which are self-accommodating to adjustment of said device to different askew relations.

4. Apparatus for spreading and feeding flatwork to an ironing machine, comprising bed-supporting means disposed adjacent to the feed end of an ironing machine, a heated bed member supported upon said bed-supporting means opposite the entrance to the said machine and having a smooth upper ironing surface, means for advancing pieces of flatwork across said ironing surface and into the pressing space of said machine, comprising a frame mounted over said bed-supporting means, an endless belt having a horizontal stretch which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing, and means on the frame supporting said belt for adjustment bodily about a vertical axis to a position in which said horizontal stretch of the belt travels along a path askew with relation to a straight fore and aft line from the spreader through the ironer.

5. Apparatus for spreading and feeding flatwork to an ironing machine, comprising bed-supporting means disposed adjacent to the feed end of an ironing machine, a heated bed member supported upon said bed-supporting means opposite the entrance to the said machine and having a smooth upper ironing surface, means for advancing pieces of flatwork across said ironing surface and into the pressing space of said machine, comprising a frame mounted over said bed-supporting means, an endless belt having a horizontal stretch which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing, means on the frame supporting said belt for adjustment bodily, about a vertical axis to a position in which said horizontal stretch of the belt travels along a path askew with relation to a straight fore and aft line from the spreader through the ironer, an operating shaft mounted to rotate on a fixed axis in said frame, and driving connections between said shaft and belt which are self accommodating to adjustment of said belt to different askew relations.

6. Apparatus for spreading and feeding flatwork to an ironing machine, comprising bed-supporting means disposed adjacent to the feed end of an ironing machine, a heated bed member supported upon said bed-supporting means opposite the entrance to the said machine and having a

smooth upper ironing surface, means for advancing pieces of flatwork across said ironing surface and into the pressing space of said machine, comprising a frame mounted over said bed-supporting means, an endless belt having a horizontal stretch which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing, and means on the frame supporting said belt for adjustment bodily about a vertical axis to a position in which said horizontal stretch of the belt travels along a path askew with relation to a straight fore and aft line from the spreader through the ironer, an operating shaft mounted to rotate on a fixed axis in said frame, and driving connections between said shaft and belt, including a spheroidal hub fixed on said shaft, a wheel member having a female spheroidal bearing portion mounted upon and keyed to said hub, and driving connections between said wheel and belt.

7. Apparatus for spreading and feeding flat work to an ironing machine, comprising a frame adapted to be mounted adjacent to the feed end of an ironing machine, and a plurality of like work spreading and feeding units mounted in side by side relation in said frame opposite the entrance to the ironing space of said ironing machine, each of said units including an endless belt having a horizontal stretch which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing and supporting and driving means for said belt, and means whereby each unit may be rotatably adjusted in the frame about a vertical axis to a position in which said horizontal stretch of the belt travels along a path askew with relation to a straight fore and aft line from the spreader to and through the ironer.

8. Apparatus for spreading and feeding flat work to an ironing machine, comprising a frame adapted to be mounted adjacent to the feed end of an ironing machine, and a plurality of like work spreading and feeding units mounted in side by side relation in said frame opposite the entrance to the ironing space of said ironing machine, each of said units including an endless belt having a horizontal stretch which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing and supporting and driving means for said belt, and means whereby each unit may be rotatably adjusted in the frame about a vertical axis to a position in which said horizontal stretch of the belt travels along a path askew with relation to a straight fore and aft line from the spreader to and through the ironer, and manually releasable means for locking said unit in any position to which it may be adjusted.

9. Apparatus for spreading and feeding flat work to an ironing machine, comprising a frame adapted to be mounted adjacent to the feed end of an ironing machine, and a plurality of like work spreading and feeding units mounted in side by side relation in said frame opposite the entrance to the ironing space of said ironing machine, each of said units including an endless belt having a horizontal stretch which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing and supporting and driving means for said belt, and means whereby each unit may be rotatably adjusted in the frame about a vertical axis to a position in which said horizontal stretch of the belt travels along either of two paths, one to the right and the other to the left, both askew, with relation to a straight fore and aft line from the spreader to and through the ironer.

10. Apparatus for spreading and feeding flat work to an ironing machine, comprising a frame adapted to be mounted adjacent to the feed end of an ironing machine, and a multiplicity, i. e., more than three, like spreading and feeding units mounted in side by side relation in said frame opposite the entrance to the ironing space of said ironing machine, each of said units including an endless belt having a horizontal stretch which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing and supporting and driving means for said belt, and means whereby each unit may be rotatably adjusted in the frame about a vertical axis to a position in which said horizontal stretch of the belt travels along a path askew with relation to a straight fore and aft line from the spreader to and through the ironer, whereby the units may be subdivided into two or more groups of two or more each, with each group including at least one belt askew to the right and one to the left, for simultaneously feeding different lots of articles to different lanes of the ironer.

11. Apparatus for spreading and feeding flat work to an ironing machine, comprising a frame adapted to be mounted adjacent to the feed end of an ironing machine, and a plurality of like work spreading and feeding units mounted in side by side relation in said frame opposite the entrance to the ironing space of said ironing machine, each of said units including an endless belt having a horizontal stretch which travels in the general direction of advance of work to the ironing machine and contacts with work so advancing and supporting and driving means for said belt, and means whereby each unit may be rotatably adjusted in the frame about a vertical axis to a position in which said horizontal stretch of the belt travels along a path askew with relation to a straight fore and aft line from the spreader to and through the ironer, a series of alined shaft sections, one for each unit, mounted to rotate on a fixed axis in the frame, separable couplings connecting the shaft sections end to end, and operating connections from each shaft section to the driving means for the belt of one of said units.

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