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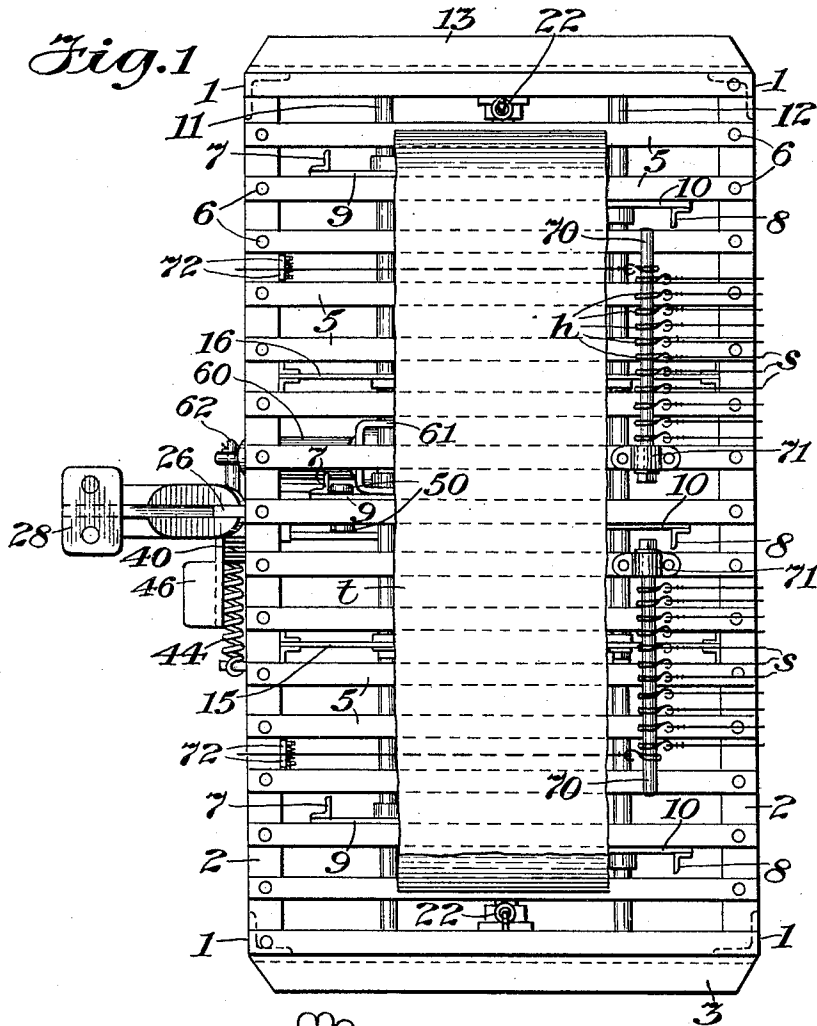
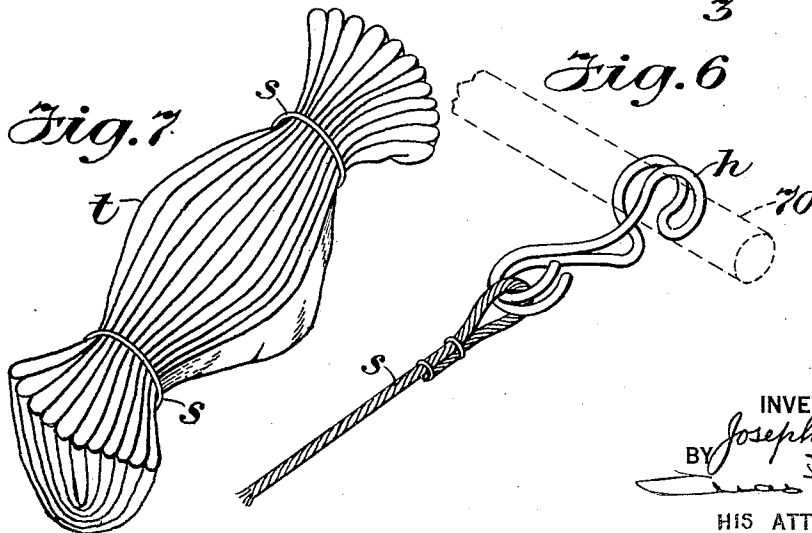
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1,880,227

TOWEL BUNDLING MACHINE

Filed Nov. 27, 1929

4 Sheets-Sheet 1



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Fig. 2

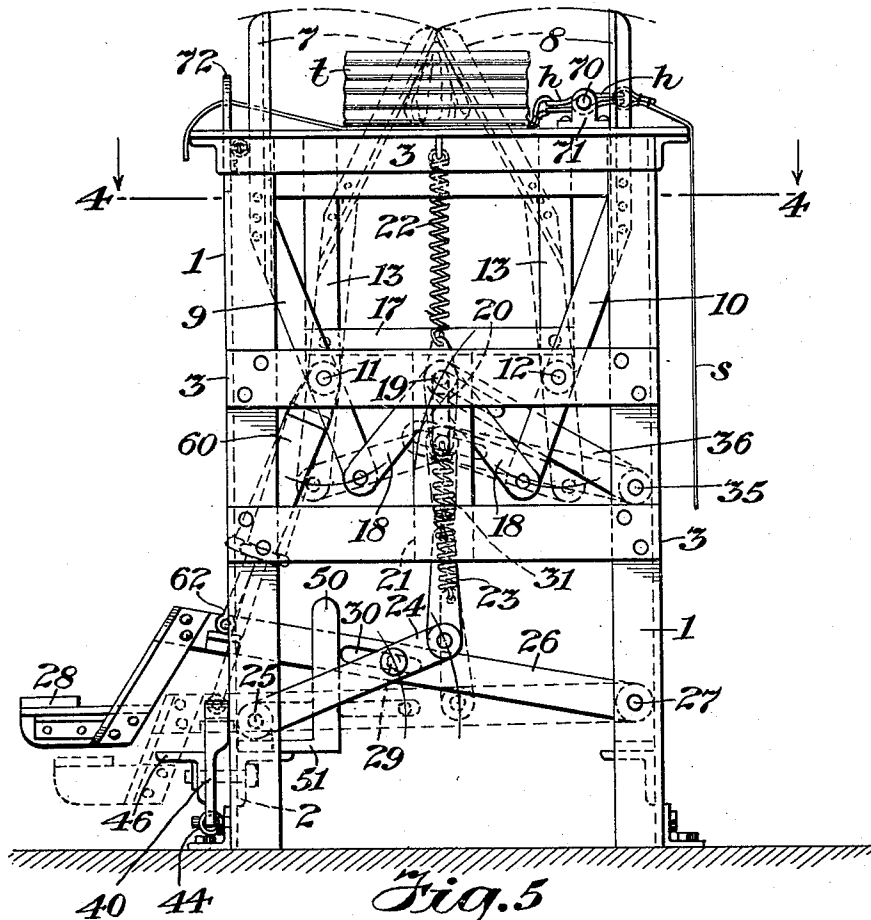
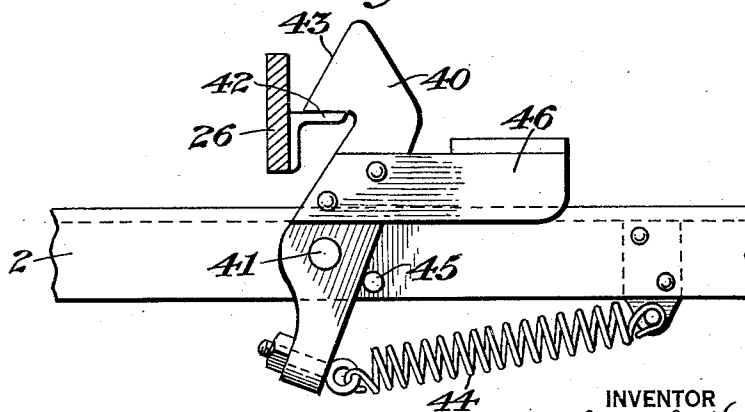


Fig. 5



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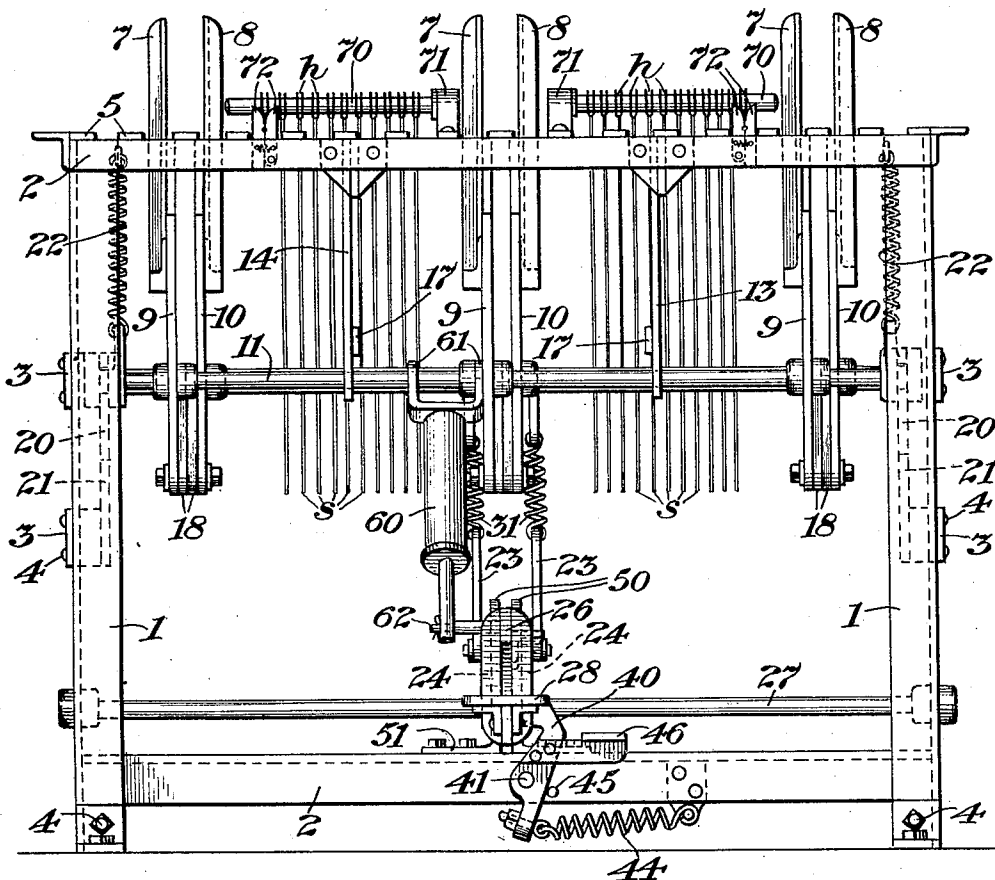
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Fig. 3



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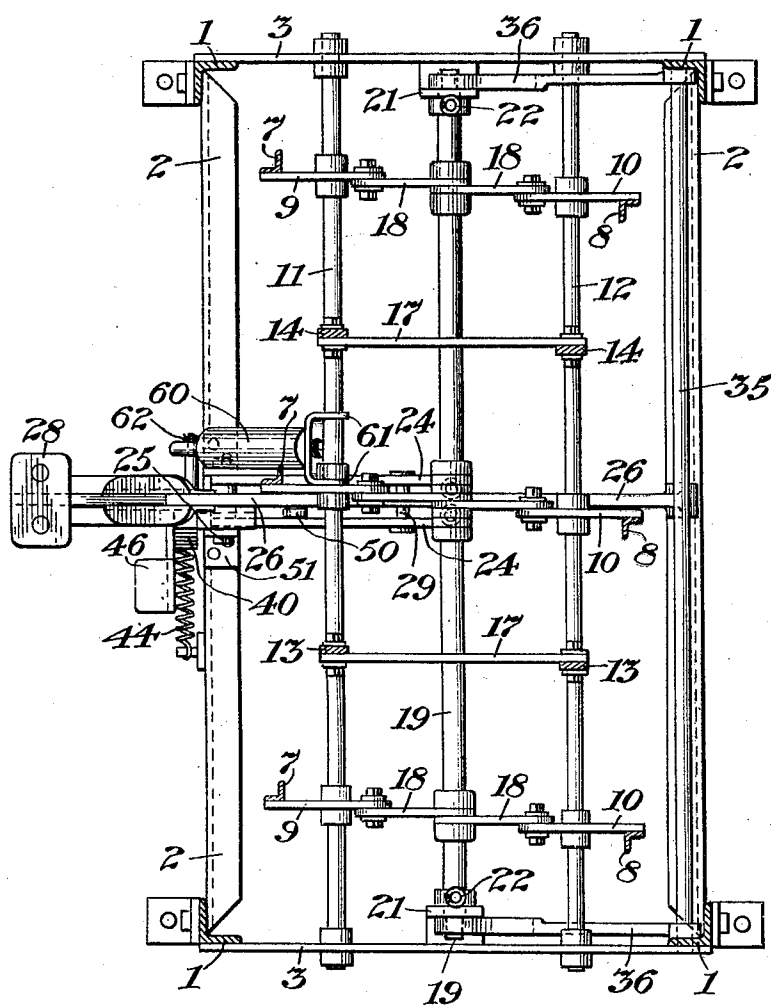
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Fig. 4



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TOWEL BUNDLING MACHINE

Application filed November 27, 1929. Serial No. 410,132.

As well known, towels are made up in at least two different forms, one in short lengths for individual use, and another in long lengths which are rolled up and carried by a support of some kind, usually a cabinet, from which the towel is drawn in successive lengths as required for use by one or any number of persons.

In the washing of these towels, no particular trouble is experienced with the short ones for the reason that there is no necessity of folding these, and, consequently, the water or other washing liquid may readily pass or circulate in contact with their entire surface. It is quite different however with the long ones in roll form. With these it has been a practice to roll the same loosely and then tie them up in bundle form preparatory to the washing operation, in an effort to open up and separate the several folds or convolutions of the towel sufficiently to permit of a free flow or circulation of the washing water through all parts of the bundle. Such method of bundling the towel has not proven satisfactory however for the reason that the folds or convolutions of the towels, particularly adjacent the ends of the bundle, have a tendency to maintain a surface contact with each other sufficiently to prevent such a flow or circulation of the washing water between the same as is necessary for the thorough cleansing of the towel. To overcome this I have provided a machine, made the subject of a co-pending application, Serial No. 411,792, filed December 12, 1929, resulting in Patent No. 1,803,826, issued May 5, 1931, which is operative to take a roll of soiled towelling and pile the same upon a table or other suitable support in a series of reversely extending superimposed folds, which folds act to maintain the adjacent layers of the towelling in a somewhat separated condition, particularly at the ends thereof, so that when the pile is subsequently drawn or bunched up in a transverse direction and tied, the resulting bundle of towelling will be sufficiently open between the folds to permit of the free circulation of the washing water between the same to assure the thorough washing of the towel.

My present invention relates to a machine for bunching and tying the towels after they have been folded in the manner set forth in my aforesaid application; the object of the invention being the production of a simple and efficient machine that will be effective for securing the folded towels in the form of small compact bundles, convenient for handling in the laundering operation, and with the folds or layers thereof in a sufficiently open or separated condition to assure the thorough washing of the same. This object I attain by means of the new and novel machine hereinafter set forth and claimed and as illustrated in the accompanying drawings, in which—

Fig. 1 is a top plan view of a machine embodying my invention.

Fig. 2 an end elevation of the same, showing the parts in their normal inoperative position in full lines and in their operative towel bunching position in dotted lines.

Fig. 3 a front elevation of the machine.

Fig. 4 a horizontal section on the line 4—4 of Fig. 2.

Fig. 5 an enlarged detail, in front elevation, of the foot operating lever latch.

Fig. 6 an enlarged view, in perspective, of one of the tying string hooks or terminals.

Fig. 7 a view of a towel after being bunched and tied on the machine.

To explain in detail, the frame of the machine, which may be of any suitable construction, is here shown as made up of angle iron, and comprises four uprights or corner posts 1 connected by horizontally extending cross-pieces at the front and back, as at 2, and by horizontally extending cross-pieces at each end, as at 3, the several parts being secured together by suitable fastening means, such as the bolts or rivets 4.

The frame at its top is provided with a plurality of spaced transversely extending slats, such as 5, permanently secured in position, as by the rivets 6, these slats forming a table or support upon which the folded towels *t* are adapted to be placed in a position extending lengthwise of the table and transversely of the slats, as shown in

Figs. 1 and 2, preliminary to being bunched and tied.

The means for bunching the towels, as here shown, comprise two sets of opposing compressor arms arranged adjacent the front and rear sides respectively of the slatted table so as to permit of the folded towels being placed on the table in a lengthwise position between the same. The front set, here shown as three in number, are indicated at 7, and the rear set, of like number, are indicated at 8. These two sets of opposing arms are normally in a widely separated position, as shown in Figs. 1 and 2, to permit of the ready placing of the towel therebetween, and are adapted to be brought towards each other to engage the opposite edges of the folded towel at separated points in its length and bunch the same together in a direction transversely of its length, as indicated by dotted lines in Fig. 2. Such bunching of the folded towel in a transverse direction, as will be readily understood, acts to separate and open up the several layers of the towel. After such bunching of the towel has been effected, and while the towel is still held between the compressor arms, it is adapted to be secured in such condition by suitable fastening means, here shown in the form of tie strings s.

The opposing compressor arms may be mounted and operated for use in the manner described by any suitable means. As here shown, they are in the form of short pieces rigidly attached to the upper ends of two series of levers 9 and 10 which are pivotally mounted at a point between their ends on two supporting rods 11 and 12 respectively, the levers 9 carrying the front set of arms 7 and the levers 10 carrying the rear set 8.

The lever supporting rods 11 and 12 are mounted at their opposite ends in the end frames, and at points intermediate their ends are supported in two pairs of hangers 13—13 and 14—14 depending respectively from fixed cross-bars 15 and 16 in the upper part of the frame; the hangers of each pair also being held in spaced relation adjacent their lower ends by attached cross-bars 17, as clearly shown in Figs. 2, 3 and 4.

The two series of compressor carrying levers 9 and 10 are pivotally connected at their lower ends, through links 18, with a rod 19 extending lengthwise of the machine with its opposite ends projecting through vertically elongated slots 20 in brackets 21 rigidly attached to the end frames at the inner sides thereof as shown. This rod 19 is normally held in a raised position, with its ends at the upper ends of the slots 20, as shown in Figs. 2 and 3, by means of springs 22, 22 at the opposite ends of the machine, which springs connect at their lower ends with collars on the rod and at their upper

ends with fixed parts of the machine. With the rod 19 in such raised position, the compressor arms are held thereby in their normal open or separated position. By lowering or depressing the rod from such position, it thereby operates through the links 18 and levers 9 and 10 to bring the attached compressor arms together in their towel compressing or bunching operation as hereinbefore described.

The rod 19 may be depressed as described by any suitable means. As here shown, it connects through a pair of links 23, 23 with the free ends of a pair of levers 24, 24 which, at their opposite ends, are pivotally connected at 25 with fixed supports on the lower front cross-piece 2 of the frame. A foot lever 26, pivotally mounted at its rear end on a cross rod 27 of the frame and at its front end carrying a foot piece 28 in position at the front side of the machine, extends between the levers 24, 24 and is operatively connected with the same by a pin-and-slot connection as shown in Fig. 2; the pin 29 of this connection being carried by the levers 24 and extending through a slot 30 in the foot lever 26. With this means, foot pressure on the lever 26, to lower the same from the full line position of Fig. 2 to the dotted line position, acts to move the compressor arms from their open full line position to their compressing dotted line position, as shown in the same figure.

The links 23, 23 as here shown, each comprise terminal attaching members connected by an intermediate spring 31, these springs providing a yielding linkage between the connected parts adapted to function as follows: The towels to be bunched and tied may be of different widths and consequently the extent of movement of the compressor arms towards each other to effect a proper bunching of the towels will vary accordingly. By having the linkage between the rod 19 and its depressing means yielding as described, such variation in the movement of the compressor arms will be automatically cared for.

In view of the loose support of the rod 19 in the slotted end bracket 21, 21, it is desirable that some means be provided to cause it to maintain its horizontal position during movement and prevent canting of the same. This I accomplish by mounting a shaft 35 in the frame adjacent its rear side and providing the same with two rigidly attached rocker arms 36, 36 having elongated slots adjacent their free ends in which the ends of the rod 19 are received, as most clearly shown in Figs. 2 and 4; these rocker arms serving to maintain the rod horizontal without in any way interfering with its free vertical movement.

When the foot lever 26 has been depressed for the purpose of bringing the compressor

arms into towel bunching position, it is desirable, as hereinbefore referred to, that it be held in such position pending the tying of the towel. To effect this, I have provided a latch device in the form of a lever 40 pivoted to the frame at 41 in position to engage with the projection 42 on the foot lever when the latter has been depressed to its lowermost position; this latch having an upper inclined surface 43 in the path of the lever projection whereby, upon the lowering of the latter, it will engage the inclined surface of the latch and force the latter laterally out of its path, following which the latch will be caused to snap into latching engagement with said lever projection, as shown in Fig. 5, under the influence of a connecting pull-spring 44, which latter yieldingly holds the latch in a normal position in contact with a stop pin 45. As a convenient means for moving the latch to releasing position, it is provided with a foot pedal extension 46.

As a means to hold the foot lever 26 against lateral movement at its front end I have provided a pair of vertically arranged guide arms 50, 50 at opposite sides thereof and so spaced as to permit of the free vertical movement of the foot lever therebetween, which arms are carried by bracket extensions 51 rigidly attached to one of the front cross-pieces of the frame as shown.

After a towel has been bunched under the compressing action of the arms 7 and 8 and tied, the foot lever is then released to permit of the arms being returned to their normal open position under the action of the springs 22, which latter, when freed, raise the rod 19 to thereby effect the opening or separating of the arms in the manner hereinbefore described. These springs 22 are preferably made of sufficient strength to quickly operate the parts in effecting the opening of the compressor arms, and it has been found desirable to cushion the movement of the parts under the action of these springs. As a simple means for doing this I have provided a pneumatic check device of usual construction, such as indicated at 60, the cylinder of which has a rigidly connected U-shaped extension 61 pivotally connecting with the stationary rod 11 and the piston rod of which connects with a pin 62 rigidly attached to the foot lever at one side thereof as shown. This check device is effective to permit of the free movement of the parts in one direction, as when the foot lever is being depressed, and to cushion the same on their reverse movement, as when the foot lever is being raised.

After a towel has been bunched up under the action of the compressor arms as described and while still retained in such condition, it is tied up for the purpose of maintaining it in such form during the subsequent laundering or washing operation. It may

be thus tied by any suitable means. In the present case, I mount two rods 70, 70 at the upper side of the slatted table and adjacent the rear side thereof, these rods extending lengthwise of the table and being mounted only at their inner or adjacent ends in brackets 71, 71 attached on the table top. Removably mounted on these rods are a plurality of tie strings 8, each string preferably being provided at one end with an attached metallic hook $\frac{1}{2}$ adapted for detachable connection with the aforesaid rods in a manner whereby they may be readily slid off the outer free ends of the latter as required for use. Such of the strings as are not required for immediate use are laid back over the rear side of the machine frame as shown, but preliminary to placing a towel on the slatted table, the outer string on each rod is drawn across the top of the table to the front side thereof and there temporarily held between a pair of spring-pressed holding members 72, 72. After a towel laid over these strings has been bunched by the compressor arms, the ends of the strings are detached from their holders, that is, the hook at one end is slid off the end of its supporting rod and the opposite end is withdrawn from its holder 72-72, after which it is tied about the towel to firmly secure it in its bunched condition and render the same ready for the washing operation.

As a matter of convenience a considerable number of these tie strings are usually mounted on each rod as shown, and after a towel has been tied up with the end strings as described, the next pair of strings are utilized for the next towel tying operation, and so on until the supply has been exhausted, after which a fresh supply of strings are positioned on the rods.

What I claim is:

1. A towel bundling machine, comprising a table having a transversely slotted top, longitudinal bars fixed in the ends of the table below the top, compressor members pivoted intermediate their ends on said bars with their upper ends projecting above the table top, an intermediate longitudinal rod, slotted guides on the table ends engaging the ends of said rod, links connecting said rod with the lower ends of said compressor members, links pivoted to the table and engaging the ends of the rod to retain said rod in substantial parallelism with the table top, foot operated means for depressing said rod, and springs connected to the rod and the table for elevating the rod.

2. A towel bundling machine, comprising a table having a transversely slotted top, longitudinal bars fixed in the ends of the table below the top, compressor members pivoted intermediate their ends on said bars with their upper ends projecting above the table top, an intermediate longitudinal rod mount-

ed on said table for movement in a vertical plane, links connecting said rod with the lower ends of said compressor members, a foot pedal for depressing the rod, means connecting the pedal to the rod, said means including a yielding pitman connected to the rod, a rock lever pivoted to the table and connected to said pitman and a pin and slot connection between the rock lever and the foot pedal lever, and springs connected to the rod and the table for elevating the rod.

In testimony whereof I affix my signature.
JOSEPH H. ADDLER.

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