Aug. 5, 1941. W. J. GIBBS 2,251,875

STORAGE AND DISPENSING APPARATUS

Original Filed March 13, 1937 2 Sheets-Sheet 1

Fig. 1

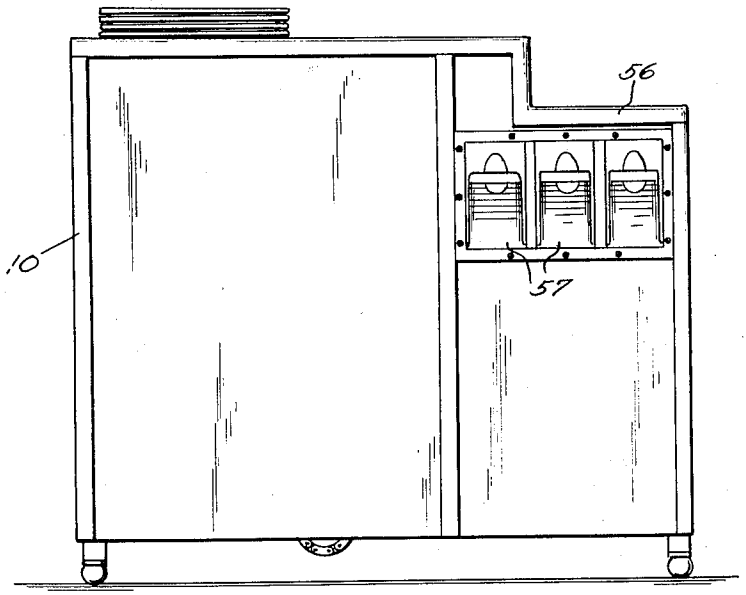
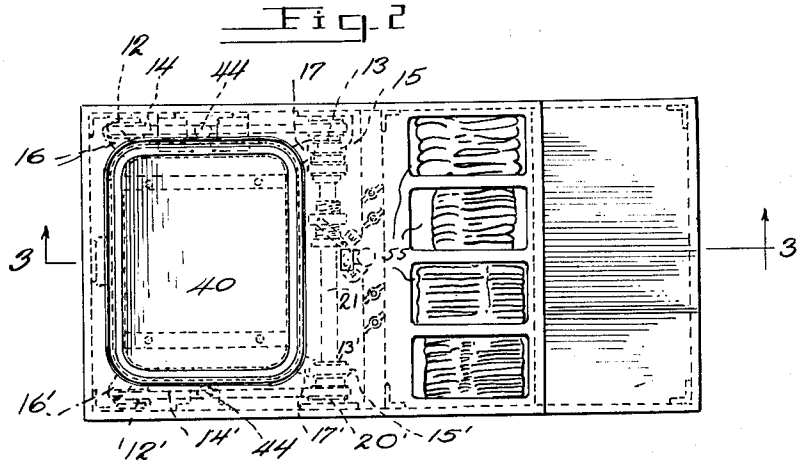


Fig. 2



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Original Filed March 13, 1937 2 Sheets-Sheet 2

Fig. 3

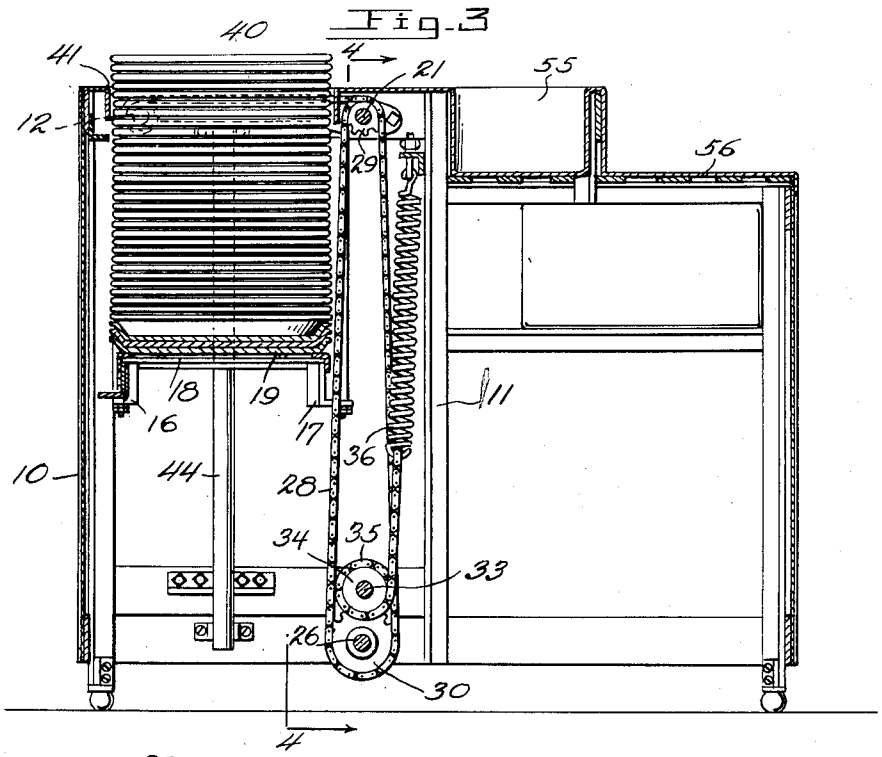
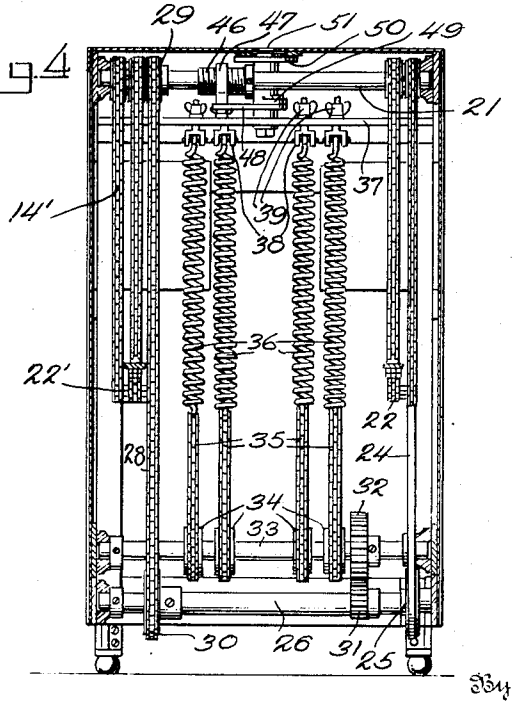


Fig. 4



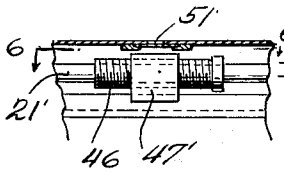


Fig. 5

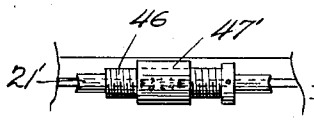


Fig. 6

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UNITED STATES PATENT OFFICE

2,251,875

STORAGE AND DISPENSING APPARATUS

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Original application March 13, 1937, Serial No. 130,787. Divided and this application January 31, 1940, Serial No. 316,674

4 Claims. (Cl. 312—71)

The present invention relates to apparatus for storing and feeding stacked articles, said apparatus being of the type described and claimed in my copending application Serial No. 130,787, filed March 13, 1937, from which this application is divided.

The invention has for its object the provision of apparatus for storing and feeding stacks of dishes such as trays, plates, saucers, cups and the like in such a position that the uppermost unit of the stack is at a predetermined convenient height and those below it are encased or held below it in a protected position ready to be fed upwardly upon removal of said uppermost member whereby the next member beneath it comes into position at said predetermined height. The motivating means are any one or any combination of such means as springs, weights, compressed air, hydraulic head, electric coil and armature, electric motor or other equivalent means and in each of the apparatus exemplifying the present invention the height of a stack or the number of members therein or the total weight thereof determines the actuation thereof so that in each case the uppermost member thereof is brought to the predetermined height or position convenient for removal. And this actuation can be adjusted so that operation will take place when the number of pieces in the stack is small or has been reduced even to one. Also the balance and actuation can be adjusted so that two or more are in position to be taken off and a corresponding number moved up into the exposed position for subsequent removal.

Other objects and advantages of the present invention will be apparent from the following description of embodiments of the invention illustrated in the accompanying drawings thereof, and from the appended claims.

In the drawings, which somewhat diagrammatically show illustrative embodiments of the present invention:

Fig. 1 is a front elevation view of a casing enclosing an embodiment of the present invention adapted for holding and feeding trays;

Fig. 2 is a plan view of the same, with some details of the enclosed mechanism shown in dotted line;

Fig. 3 is a vertical section view taken along the line 3—3 of Fig. 2 and looking in the direction of the arrows;

Fig. 4 is a vertical section view taken along the line 4—4 of Fig. 3 and looking in the direction of the arrows;

Fig. 5 is an elevation view of an alternative embodiment of a gauge shown in Fig. 2 and in the upper part of Fig. 4; and

Fig. 6 is a plan view of the same taken along the line 6—6 of Fig. 5, looking in the direction of the arrows.

Referring to Figs. 1 to 4 of the drawings, a casing 10 encloses a framework 11 which at one end near the top supports the spaced apart pairs of sprockets 12, 12' and 13, 13' over which pass the two pairs of sprocket chains 14, 14' and 15, 15' which at respective ends connect with the two pairs of lugs 16, 16' and 17, 17', which in turn support the four corners of carrier 18 which had fixed thereto a tray 19. Said chains 14, 14' extend vertically from the lugs 16, 16' to and over the sprockets 12, 12' rotatably mounted on aligned stub shafts fixed to the frame and thence horizontally to and over sprockets 20, 20' mounted on a common shaft 21 with said sprockets 13, 13' and thence downwardly for connection at their ends with connector lugs 22, 22'. Lug 22 connects chain 14 with chain 15 and a tape 24 which passes downwardly to and is fixed on a drum 25 fixedly mounted on the rotatable shaft 26 mounted near the bottom of said framework 11. Said lug 22' connects chains 14' and 15' to an endless chain 28 which at an upper turn passes over a sprocket 29 mounted on said shaft 21 and at a lower turn passes under a sprocket 30 mounted on said shaft 26. The arrangement is such that chains 14, 14' and 15, 15' have uniform movement when the carrier is raised or lowered.

Fixed on said shaft 26 is a gear pinion 31 which meshes with a gear 32 mounted on a shaft 33 which carries four drums 34, 34 to which latter connect respective ends of sprocket chains 35, 35 whose upper ends connect to ends of corresponding tension springs 36, 36 whose upper ends in turn connect to the horizontal bar 37 by means of respective clevis bolts 38, 38 having the adjusting wing nuts 39, 39.

On said fixed tray 19 is shown a load of stacked trays 40, 40 to whose weight, as translated through said pinion 31 and gear 32, said springs 36, 36 are calibrated so that the addition or removal of one or more of said trays 40 to or from the stack results in a proportional lowering or raising of the said carrier 18 and its stacked trays 40 whereby the upper level of said stacked trays 40 is always at a substantially predetermined elevation with respect to an opening 41 in the upper surface of said casing 10, said pinion 31 and gear 32 being at a predetermined ratio with respect to each other and to the size of said drums 34, 34 whereby the lower ends of said

springs 36, 36 move a shorter distance than said carrier 18.

At said opening 41, said casing 10 has formed a downwardly extending flange 43 which serves as a guide for said stacked trays 40, 40 and a pair of vertical rods 44, 44 fixed to said framework 11 one on each side, serve as tray guides below said flange 43.

On said shaft 21 a screw 46 carries a nut 47 which connects to and is held against rotation by one end of a link 48 whose other end connects to a horizontal crank arm 49 rotatably mounted on said horizontal bar 37 and carrying on its upper end a gauge 50 which shows through a window 51 in the upper surface of said casing 10 and indicates the number of trays or proportion of full load at any time on said carrier 18. An alternative form of gauge is shown in Figs. 5 and 6 in which a nut 47' is extended in length and has marked thereon indicating marks which register with a window 51' corresponding to said window 51.

Referring particularly to Figs. 1, 2 and 3, the upper part of said casing 10 has formed therein, adjacent said opening 41, the receptacles 55, 55 for knives, forks, spoons and other cutlery and adjacent thereto a step 56 for holding an individual tray which has been removed from said stacked trays 40 while cutlery is being taken from said receptacles 55, 55 and said step 56, said casing 10 has formed in the side thereof the napkin boxes 57, 57.

In operation of the apparatus, stacked articles of uniform size and weight are simply placed on the carrier or added to stacked articles thereon. This loading is at the top of the apparatus and at a convenient height to avoid the necessity of an operator stooping or abnormally reaching to load or unload articles to or from the top of the stack. The casing presents a service top or counter and the uppermost unit of the stack is positioned at a predetermined level above the casing. The calibrated springs and mechanism described are adjustable to accommodate the apparatus to loads whose units are of different thickness or of different weights, said adjustment being effected by changing the tension of the springs. The arrangement is such that for any given load of uniform articles the carrier so positions itself that the top of the load or stack is always presented at a predetermined level with respect to the top of the casing. The unit is such as to be capable of forming part of a service counter or the like.

While the invention has been described in connection with a specific embodiment, it is to be understood that the words which have been used are words of description rather than of limitation, and that practice of the invention within the scope of the appended claims may be resorted to without departing from the true scope and spirit of the invention in all its aspects.

I claim:

1. In a storing and feeding mechanism for stacked articles, in combination, a support having an apertured top portion for passage therethrough of stacked articles, a vertically movable carrier adapted to hold a load of stacked articles extending through the aperture in said top portion with the uppermost article of the stack at a predetermined level, means for movably supporting said carrier comprising a plurality of spaced aligned members rotatably mounted on said support, a plurality of flexible connections engaging said rotatable members and having ends fixed to the carrier, and means for counterbalancing said carrier and any stacked load thereon so that the uppermost unit of the stack occupies a predetermined position above said top portion, said means comprising a driven shaft connected to ends of said flexible connections and rotatably mounted on said support, a power shaft parallel to said driven shaft, gears connecting said shafts for simultaneous rotation, and means for rotating said power shaft comprising an adjustable calibrated spring tensioning means.

2. In a storing and feeding mechanism for stacked articles, in combination, a support having an apertured top portion for passage therethrough of stacked articles, a vertically movable carrier adapted to hold a load of stacked articles extending through the aperture in said top portion with the uppermost article of the stack at a predetermined level, means for movably supporting said carrier comprising a plurality of spaced aligned members rotatably mounted on said support, a plurality of flexible connections engaging said rotatable members and having ends fixed to the carrier, and means for counterbalancing said carrier and any stacked load thereon so that the uppermost unit of the stack occupies a predetermined position above said top portion, said means comprising a driven shaft connected to said flexible connections, whereby the carrier and its stacked load tends to turn said shaft in one direction, and means for counterbalancing said carrier and any load thereon, said means comprising a calibrated spring tensioning device including a power shaft geared to said driven shaft, said counterbalancing means being adapted to raise said carrier and stacked load thereon a predetermined distance as the load on the carrier is decreased.

3. In a storing and feeding mechanism for stacked articles, in combination, a support having an apertured top portion for passage therethrough of stacked articles, a vertically movable carrier adapted to hold a load of stacked articles extending through the aperture in said top portion with the uppermost article of the stack at a predetermined level, means for movably supporting said carrier comprising a plurality of spaced aligned members rotatably mounted on said support, a plurality of flexible connections engaging said rotatable members and having ends fixed to the carrier, and means for counterbalancing said carrier and any stacked load thereon so that the uppermost unit of the stack occupies a predetermined position above said top portion, said means comprising a driven shaft connected to said flexible connections whereby the carrier and its stacked load tends to turn said shaft in one direction, means for counterbalancing said carrier and any load thereon, said means comprising a calibrated spring tensioning device including a power shaft geared to said driven shaft, said counterbalancing means being adapted to raise said carrier and stacked load thereon a predetermined distance as the load on the carrier is decreased, and means visible through the top portion of the support for indicating quantities of stacked articles on the carrier, said means being operatively connected to said carrier supporting mechanism.

4. In a storing and feeding mechanism for stacked articles, in combination, a supporting frame having an apertured horizontal top, a car-

rier supported by said frame and adapted for vertical movement and adapted to hold a load of stacked articles extending through said top aperture with the uppermost article at a predetermined level above the top, said carrier supporting means comprising a plurality of spaced aligned sprockets rotatably supported on said frame, a plurality of sprocket chains engaging said sprockets, and means for counterbalancing said carrier and any load thereon so that the uppermost unit of the stack occupies said predetermined position, said means comprising a driven shaft connected to the ends of said sprocket chains and rotatably mounted on said support, a power shaft geared to said driven shaft and having a plurality of spaced drums rotatable therewith, a plurality of tension springs each having an end connected to said support and the other end connected with a respective drum on said power shaft, and means for adjusting the tension of said springs.

WILLIAM J. GIBBS.