

Jan. 12, 1971

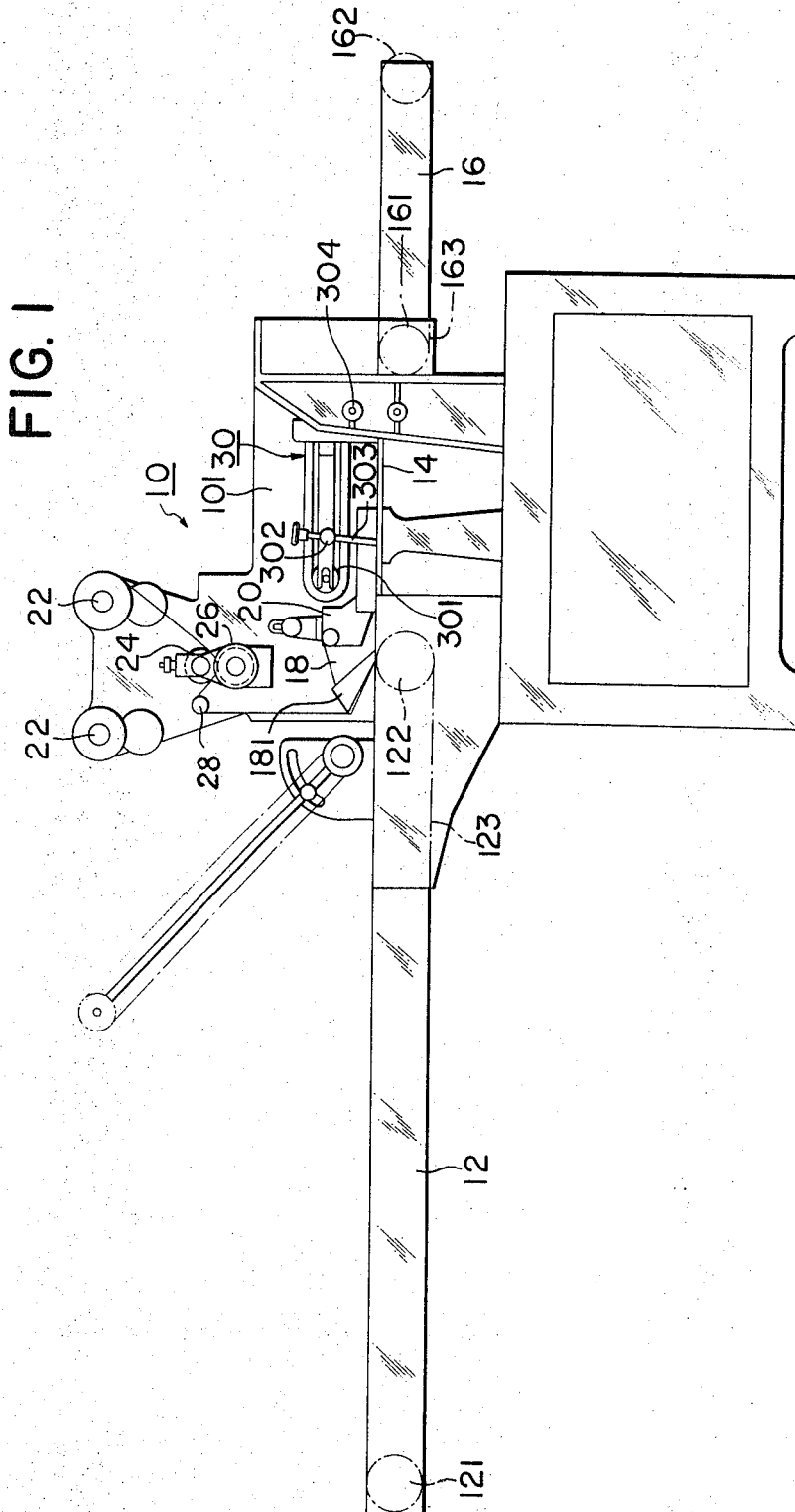
KIYOSHI SEKO

3,553,933

AUTOMATIC WRAPPING MACHINE

Filed July 1, 1969

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

FIG. 2

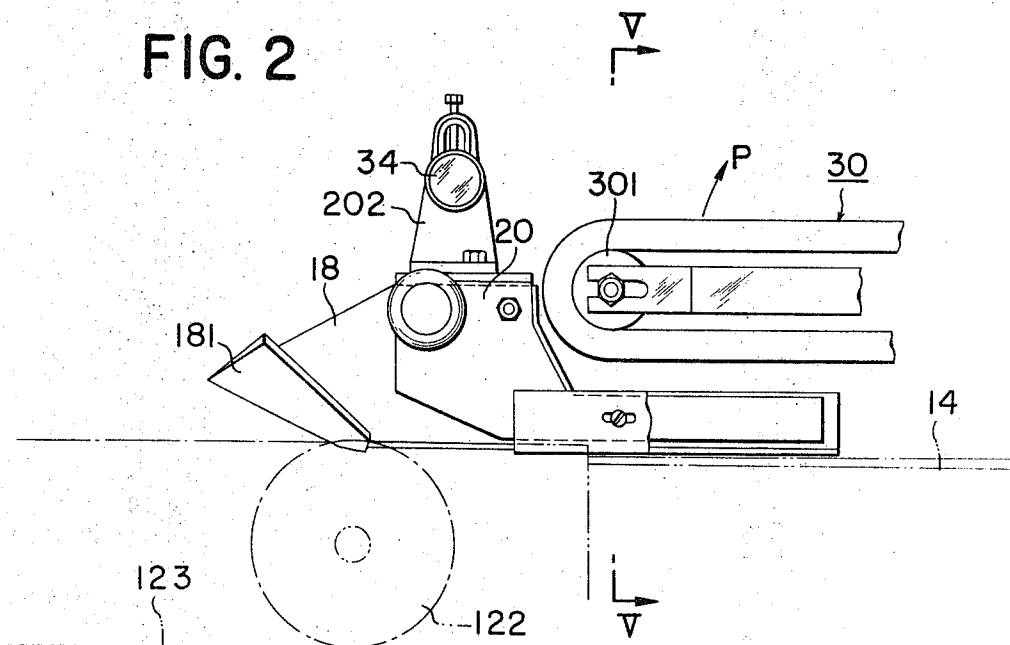
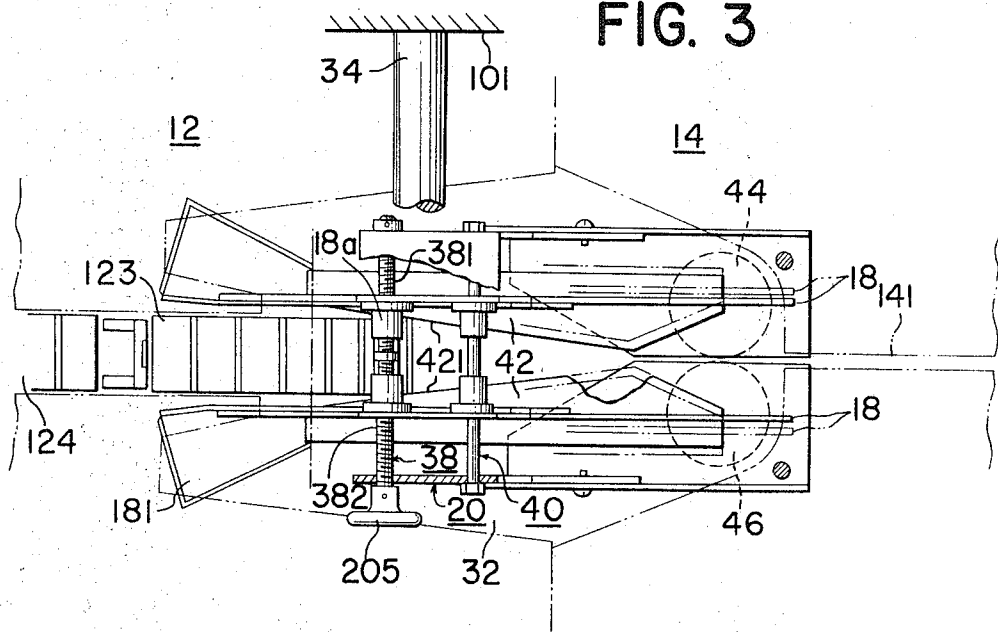


FIG. 3



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FIG. 4

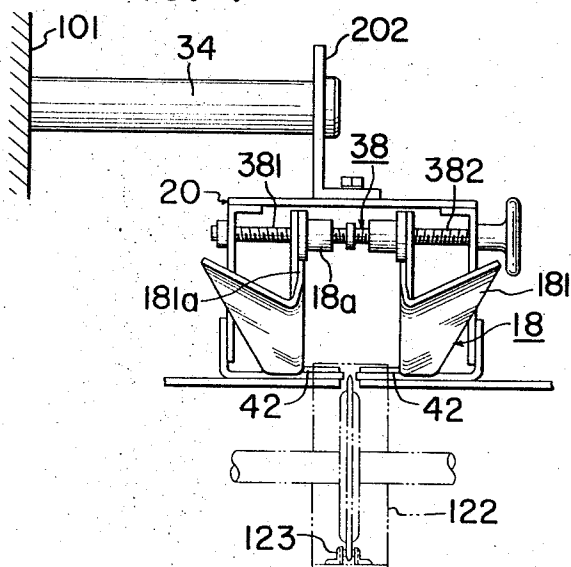


FIG. 5

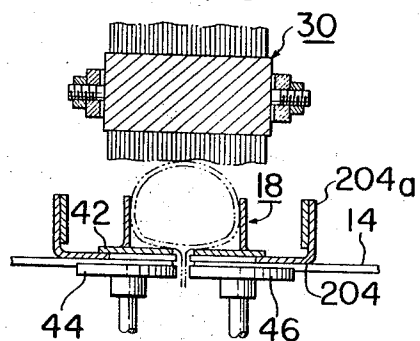
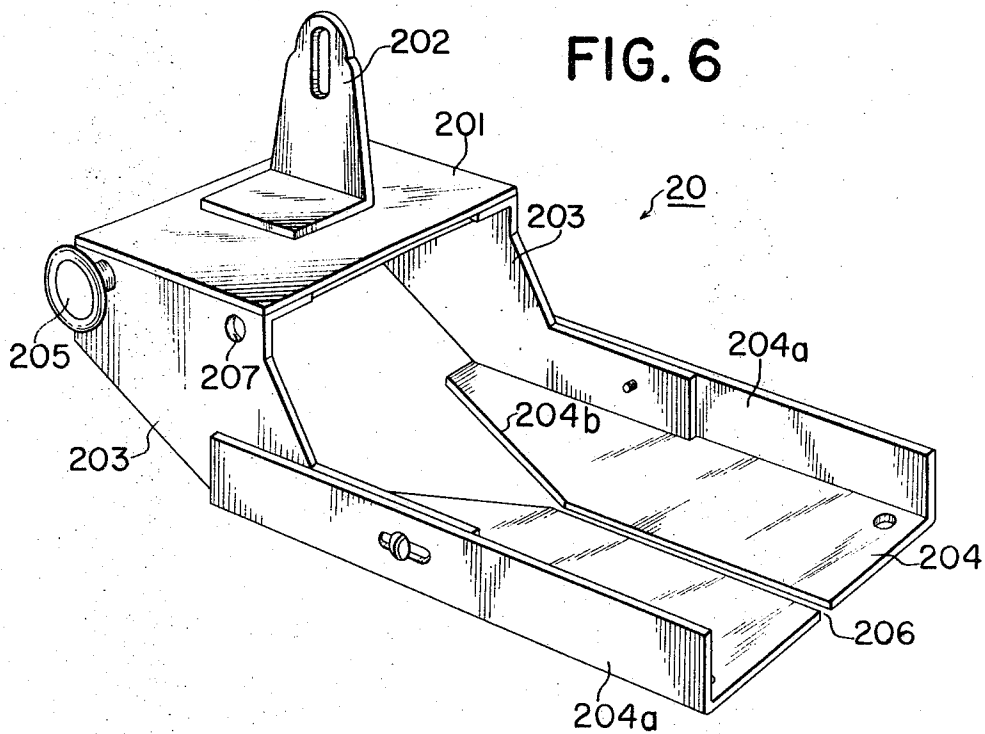


FIG. 6



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AUTOMATIC WRAPPING MACHINE

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4 Claims

ABSTRACT OF THE DISCLOSURE

An automatic wrapping machine comprises a pair of folding guide members mounted on a threaded bolt through tapped elements, respectively. The bolt for one half its length is right-hand pitch threaded and for the other half left-hand pitch threaded, whereby the space between the folding guide members can be controlled by turning a handle secured to the bolt.

This invention relates to an improvement in an automatic wrapping machine, and more particularly to an improved means for adjusting the space between folding guide members of a wrapping machine for guiding wrapping paper or wrapping sheet material.

In recent years, sealed or semisealed wrapping has been widely adopted to protect and increase the commercial value of various commodities or articles, for example, foodstuffs such as bread and seafood, confectioneries such as chocolate and biscuits, medicines, metallic articles, and other miscellaneous goods. Such sealing is preferably accomplished by heat sealing or press sealing of wrapping paper or wrapping sheet made of various materials, such as polypropylene, high pressure or medium pressure polyethylene, laminated cellophane, moisture-proof cellophane, press seal paper, etc.

In a conventional automatic wrapping machine for effecting the aforesaid sealed wrapping, elongated wrapping sheet material is spread and fed toward a wrapping table from above or from an obliquely upward direction while keeping the opposing longitudinal side edges of the sheet in contact with a pair of folding guide members mounted on the wrapping table, converting the feeding direction of the wrapping sheet material in parallel with the wrapping surface of the table while laterally bending the sheeting material so as to produce an Omega-shaped cross section between the folding guide members, directing commodities to be wrapped onto the wrapping sheet material at the bent portion, which commodities are fed in synchronism with the feeding speed of the wrapping sheet material, and closing or sealing the wrapping sheet while folding the same.

Such a conventional automatic wrapping machine is, however, usually designed as a specialized machine for wrapping commodities of a particular kind in succession. Accordingly, it is usually impossible to vary the space between the pair of cooperating folding guide members, and it is not possible with the conventional wrapping machine to wrap commodities of different dimensions by using wrapping sheet materials having different widths.

Therefore, an object of the present invention is to provide an improved automatic wrapping machine which completely obviates the aforesaid difficulties of the conventional automatic wrapping machine.

A specific object of the present invention is to provide an automatic wrapping machine of universal type, which consists of a pair of folding guide members which are threadedly mounted on a lever with a handle secured thereto, so that the space between the folding guide members can be adjusted at will by turning the handle while keeping the center line of the space in alignment with

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the longitudinal center line of the wrapping sheet material to be continuously fed therebetween.

Another object of the present invention is to provide an automatic wrapping machine having an adjusting means for a pair of folding guide members, which controls the space between the pair of the folding guide members by moving both of the folding guide members in symmetry with respect to the longitudinal center line of the wrapping sheet material, or the center line of the wrapping sheet material in the feeding direction thereof, whereby the need for readjustment of the folding guide members after controlled movement is entirely eliminated.

Other objects and a fuller understanding of the present invention may be had by referring to the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a schematic elevation of an automatic wrapping machine, according to the present invention;

FIG. 2 is a side view, with a part cut away, of a means for adjusting a space between folding guide means;

FIG. 3 is a plan view of the space adjusting means of FIG. 2;

FIG. 4 is an elevation of the space adjusting means of FIG. 2;

FIG. 5 is a section taken along the line V-V of FIG. 2; and

FIG. 6 is an enlarged perspective view of a holding framework.

Like parts or members are designated by like numerals and symbols throughout the drawings.

Referring to FIG. 1, an automatic wrapping machine of the invention, as generally represented by reference numeral 10, comprises a commodity feeding table 12, a wrapping table 14, and a wrapped commodity conveyor 16. There are a folding guide means having a pair of guide members 18 and a holding framework 20 of the guide means, which are both disposed on the wrapping table 14. A pair of sprocket wheels 121 and 122 are rotatably mounted at the tip of the commodity feeding table 12 and below the front end of the folding guide members 18, respectively, and a conveyor chain 123 is operatively engaged with the sprockets 121 and 122, so as to feed the commodities to be wrapped toward the wrapping table 14. Above the junction between the commodity feeding table 12 and the wrapping table 14, there is disposed a wrapping sheet feeding mechanism consisting of a pair of take-up shafts 22, 22, a pair of wrapping sheet delivering rolls 24, 26, and a guide rod 28, so that wrapping sheet material can be delivered toward wings 181 of the folding guide members 18. The delivery of the wrapping sheet material is mainly carried out by the aforesaid pair of delivering rolls 24, 26, one of which is preferably lined with a resilient substance, e.g., rubber. If the pulling force acting on the wrapping sheet material by the delivering rolls 24, 26 is too large, the wrapping sheet material tends to wrinkle or the wrapping sheet material might be severed when being closed or sealed, as will be described after. Therefore, the magnitude of the pulling force should be carefully chosen, for instance, at a magnitude barely large enough to hold the wrapping sheet material against manual pulling.

While passing through the folding guide members 18 and holding framework 20, the wrapping sheet is folded so as to wrap each commodity and the longitudinal edges of the wrapping sheet are brought into contact with each other and joined together substantially along the longitudinal center line of the commodity, as will be described in detail hereinafter. The wrapping sheet is sealed or closed at the front and rear ends of the commodity by a suitable means (not shown). The commodity thus

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wrapped is then transferred toward the wrapped commodity conveyor 16 by a transferring means 30 located above the wrapping table 14. The wrapped commodity conveyor 16 comprises a pair of belt pulleys 161, 162, and a conveyor belt 163 spanned between the belt pulleys. The transferring means 30 can be made in the form of an endless belt driven by a belt pulley 301. If it is desired to transfer the commodities by lightly pressing them without deforming or deteriorating them, the operative surface of the conveyor belt of the transferring means 30 can be provided with brush-like fibers, as shown in FIG. 5. In order to facilitate the transferring operation of commodities of different dimensions, the height of the transferring means 30 relative to the wrapping table 14 can be adjusted by means of a height adjusting member 303 mounted on a raising lever or an upright bracket 302. Furthermore, the transferring means 30 can be turned about a shaft 304, as shown by the arrow P of FIG. 2, so as to facilitate the cleaning or adjustment thereof.

Referring to FIG. 3, the commodity feeding table 12 has a gap 124 along the feeding line, so as to expose the conveyor chain 123 in the gap 124 for conveying the commodities across the feeding table 12. The wrapping table 14 also has a gap or slit 141 formed along the feeding line across the wrapping table, so as to allow the movement of the folded edge portion of the wrapping sheet therethrough, as will be described hereinafter. The gap 124 is disposed in alignment with the slit 141. There is left a comparatively wide gap 32 between the gap 124 of the commodity feeding table 12 and the slit 141 of the wrapping table 14, as shown by dash-dot-dot-dash lines in FIG. 3. A holding framework 20 of the folding guide members 18 is so disposed as to communicate the gap 124 with the slit 141 through the folding guide members 18 and the slit 206 of the holding framework 20. The holding framework 20 holds the pair of holding guide members 18 in symmetry with each other with respect to a line connecting the center lines of the gap 124 and the slit 141, while allowing the adjustment of the space between the folding guide members 18 by moving them in opposite directions by the same distance.

The holding framework 20 comprises a top panel 201, having a mounting lug 202, a pair of side boards 203 secured to laterally opposed edges of the top panel, and a pair of bottom plates 204. Each bottom plate 204 has a vertically bent portion 204a, which is connected to the corresponding side board 203 by suitable elements such as screws, as shown in FIG. 6. Between the pair of the bottom plates 204, there is left a gap 206, which is disposed in alignment with the gap 124 and the other slit 141 of the wrapping table. A V-shaped notch 204a is formed at the front end of the gap 124 below the side boards 203, as shown in FIG. 6. A threaded bolt 38 is rotatably held by the side boards 203, and a handle 205 secured to one end of the threaded bolt 38 is disposed outside of the holding framework 20 so as to facilitate the turning of the threaded bolt from the outside.

As shown in FIGS. 2 and 4, the holding framework 20 is suspended from housing 101 of the machine 10 by securing the holding lug 202 to a cantilever shaft 34 integrally formed on the housing 101, as shown in FIG. 1. The threaded bolt 38 has a right-hand pitch thread 381 formed on one half thereof and a left-hand pitch thread 382 formed on the other half thereof, as shown in the figures. A pair of folding guide members 18 have tapped members 18a secured thereto, so that folding guide members can be meshed with the bolt 38 in such manner that the space between the folding guide members can be adjusted by turning the handle 205. More particularly, the rotation of the threaded bolt 38 caused simultaneous movement of the pair of the folding guide members 18 toward each other or away from each other by the same distance. Each folding guide member 18 has a horizontal plate 42 and a vertical plate integrally secured to the horizontal plate at right angles thereto, respectively. The

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bottom plate is slidably held on the corresponding bottom plate 204 of the holding framework 20. The vertical plate has the said tapped member 18a secured thereto and a wing portion 181 formed at the front end thereof. The folding guide members extend forwardly out of the holding framework 20, and the wing portions 181 are located outside of the framework 20. In order to facilitate the movement of the folding guide members 18 relative to each other, a rod 40 is provided across the side boards 203, and an opening 207 is bored on each side board to secure the end portion of the rod 40 thereto. The vertical plate of each folding guide member 18 has, of course, an aperture slidably engaging the rod 40.

The wing portions 181 of the folding guide members 18 are made by bending the front end of the vertical plate obliquely upwards so as to form guide edges 181a to guide the turning of wrapping sheet material from substantially vertical movement to substantially horizontal movement while wrapping articles to be wrapped, as shown in FIGS. 1 to 4. A V-shaped notch 421 is formed at the front end of the horizontal plates 42 of the folding guide members 18, as best shown in FIG. 3. The angle at the vertex of the V-shaped notch 421 should preferably be larger than the corresponding angle of the V-shaped notch 204a of the holding framework 20, in order to ensure smooth folding of wrapping sheet material. The rear end of the horizontal plates 42 are spaced from each other by a distance wider than the width of the slot 206 between the bottom plates 204 of the holding framework 20.

In operation, the position of the guide edges 181a is of the folding guide members 18 so adjusted by turning the handle 205 as to suit the width of the wrapping sheet material fed from above through delivering rolls 24, 26. By action of the wing members 181, the wrapping sheet material encloses each article or commodity being fed by the conveyor chain 123 of the feeding table 12 in synchronism with the delivery of the wrapping sheet material. After passing through the wing members 181, of the folding guide members 18, the wrapping sheet material is so guided as to enclose the commodity with a substantially Omega-shaped cross section, as shown in FIG. 5. By the action of the V-shaped notch 421 of the horizontal plates 42 of the folding guide members 18, as the wrapping sheet material is fed rearward together with the commodity being wrapped, the folded lower edges of the wrapping sheet material are gradually brought toward each other, until the lower edges are brought in contact with each other at the slit 141 of the wrapping table 14, as shown in FIG. 5. A pair of heating or pressing rolls 44, 46 are disposed toward the rear end of the wrapping table 14, and the lower edges of the folded wrapping sheet member are thermally sealed together or pressed together by the rolls 44 and 46. As the commodities are further transferred on the wrapping table 14 by the transferring means 30, the wrapping sheet material is closed or sealed at the front end and the rear end of each commodity being wrapped by a suitable closing or sealing means (not shown), and then the sealed ends of the wrapping sheet are cut by a suitable cutter (not shown). The type and the function of the closing or sealing means and the cutter do not form a part of the present invention, and hence they are not described any further in the specification.

As described in the foregoing, according to the present invention, the distance or spacing between a pair of folding guide members 18 to guide wrapping sheet material can be adjusted in symmetry with respect to the feeding center line of the wrapping sheet material, either toward or away from each other, simply by turning a handle 205, due to the engagement of the oppositely threaded bolt 38 and tapped members 181a of the folding guide members. Thereby, with the automatic wrapping machine of the invention, commodities of different dimensions can be wrapped by using wrapping sheet material having different

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widths. Furthermore, the adjustment of the space of the folding guide members in symmetry with the feeding center line eliminates the need of readjustment of the commodity feeding table or wrapping sheet delivering means.

Although the present invention has been described with a certain degree of particularity, it is understood that the present disclosure has been made only by way of example and that numerous changes in details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and the scope of the invention as hereinafter claimed.

What I claim is:

1. An automatic wrapping machine comprising means for continuously delivering an elongated wrapping sheet material substantially from above; means for feeding commodities to be wrapped in synchronism with the delivery of the wrapping sheet material; a folding means for turning the movement of the wrapping sheet material from vertical to horizontal while folding the wrapping sheet material in Omega-shaped cross section for wrapping the commodity; and means for joining folded edges of the wrapping sheet material; said folding means comprising a folding guide means including a threaded bolt having a right-hand pitch thread in one half the length thereof and a left-hand pitch thread the other half thereof, a pair of tapped members engaging the right-hand pitch and the left-hand pitch threads, respectively, a pair of wings secured to said tapped members, respectively, and a pair of bottom plates secured to the wings, respectively; and a framework for supporting the folding guide means, which framework includes a pair of bottom plates spaced by a distance corresponding to a slit formed on a wrapping table, a pair of side boards rotatably supporting said threaded bolt, and a handle for rotating said threaded bolt, whereby the space between the wings and between the bottom plates in said folding guide means can be adjusted by turning said handle, so that commodities of different dimensions can be wrapped with use of wrapping sheet materials of different widths.

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2. An automatic wrapping machine as set forth in claim 1, wherein said pair of bottom plates of said folding guide means have a V-shaped notch, and said pair of bottom plates of the holding framework have another V-shaped notch which cooperates with said V-shaped notch of the folding guide means in folding the opposing longitudinal edges of the wrapping sheet material.

3. An automatic wrapping machine as set forth in claim 2, wherein the angle at the vertex of the V-shaped notch of the folding guide means is larger than the corresponding angle of the V-shaped notch of said holding framework, whereby the folding of the wrapping sheet material is carried out gradually and smoothly.

4. An automatic wrapping machine as set forth in claim 1, wherein an alignment is established among the feeding center line of the commodities feeding means, delivering center line of the wrapping sheet material delivering means, the junction between the right-hand pitch thread and the left-hand pitch thread portions of said threaded bolt, the center line of the slit on the wrapping table, and the center line of the gap between bottom plates of the holding framework, whereby the automatic wrapping machine can be adjusted for wrapping commodities of different dimensions with use of wrapping sheet materials of different widths only by adjusting the folding guide means without adjusting the commodities feeding means and the wrapping table.

References Cited

UNITED STATES PATENTS

2,112,720	3/1938	Stockstrom	93—82
3,417,544	12/1968	Grevich	53—180
3,494,096	2/1970	Suzuki	53—183

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