US 20030192285A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2003/0192285 A1**

(43) **Pub. Date: Oct. 16, 2003**

Liao

(54) **PACKAGE FILM TENSION ADJUSTING DEVICE OF PACKAGING MACHINE**

(76) Inventor: **Benker P.C. Liao**, Taipei (TW)

Correspondence Address:
ROSENBERG, KLEIN & LEE
3458 ELLICOTT CENTER DRIVE-SUITE 101
ELLICOTT CITY, MD 21043 (US)

(21) Appl. No.: **10/122,230**

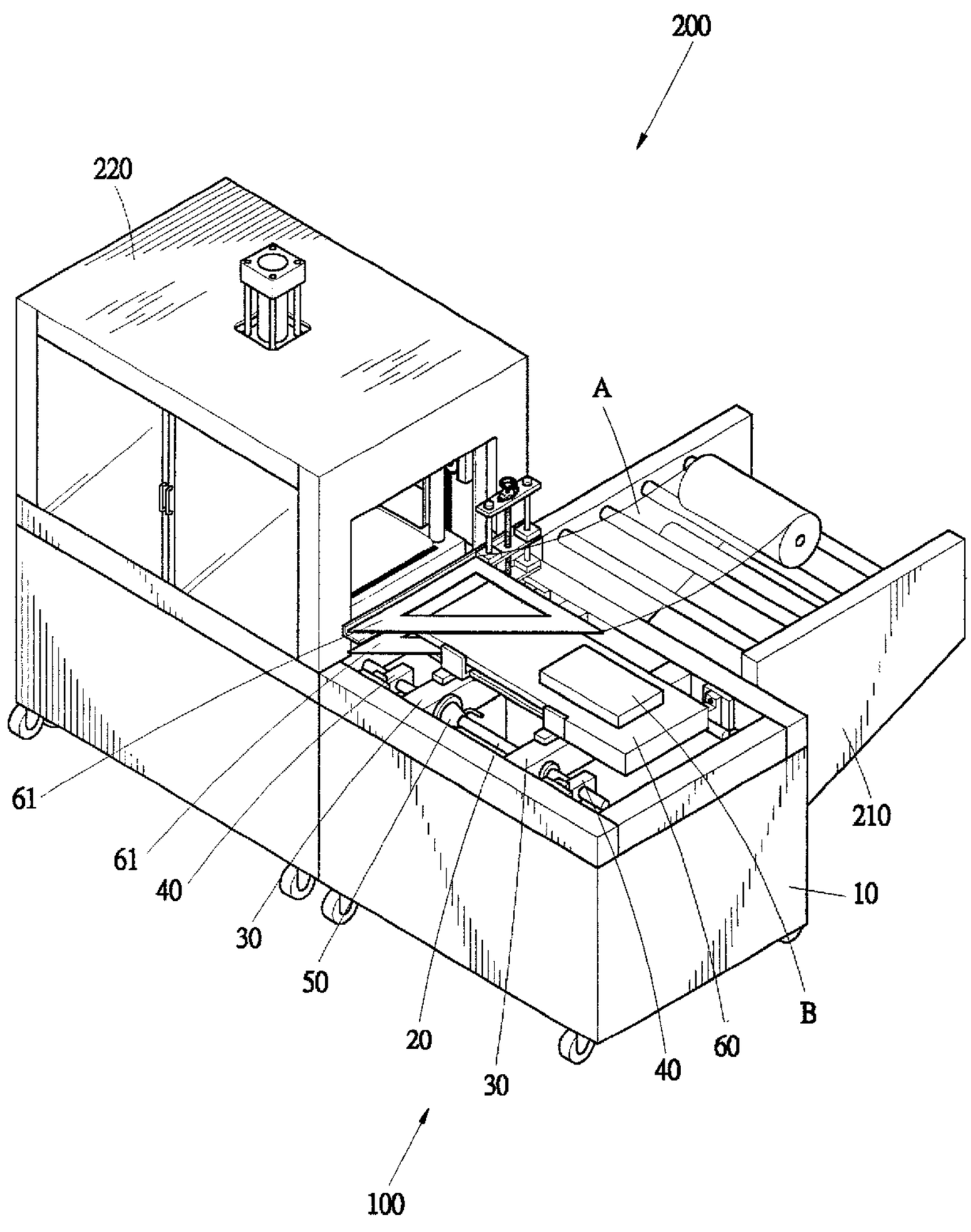
(22) Filed: **Apr. 16, 2002**

Publication Classification

(51) **Int. Cl.**[7] **B65B 41/12**
(52) **U.S. Cl.** **53/389.2**

(57) **ABSTRACT**

A packaging machine includes a supply of a package film and a wrapping/sealing section into which products to be packaged are conveyed. A package film tension adjusting device is arranged between the supply of the package film and the wrapping/sealing section for routing the package film to the wrapping/sealing section and for adjusting the tension of the package film supplied to the wrapping/sealing section. The package film tension adjusting device includes a chassis inside which two rails are fixed. Two slide blocks are movably supported on the rails and are movable toward/away from the wrapping/sealing section along the rails. A conveyor is supported on the slide blocks for conveying the products into the wrapping/sealing section. Film routing members are attached to the conveyor for routing the package film toward the wrapping/sealing section. Moving the slide blocks along the rails causes the distance between the film routing members and the wrapping/sealing section to be changed thereby changing the tension of the package film supplied from the film routing members to the wrapping/sealing section in a stepless manner. A locker unit is mounted to at least one of the slide blocks for releasably securing the slide block at a desired position along the rails. A screw rod threadingly engages the slide blocks for moving the slide blocks along the rails.



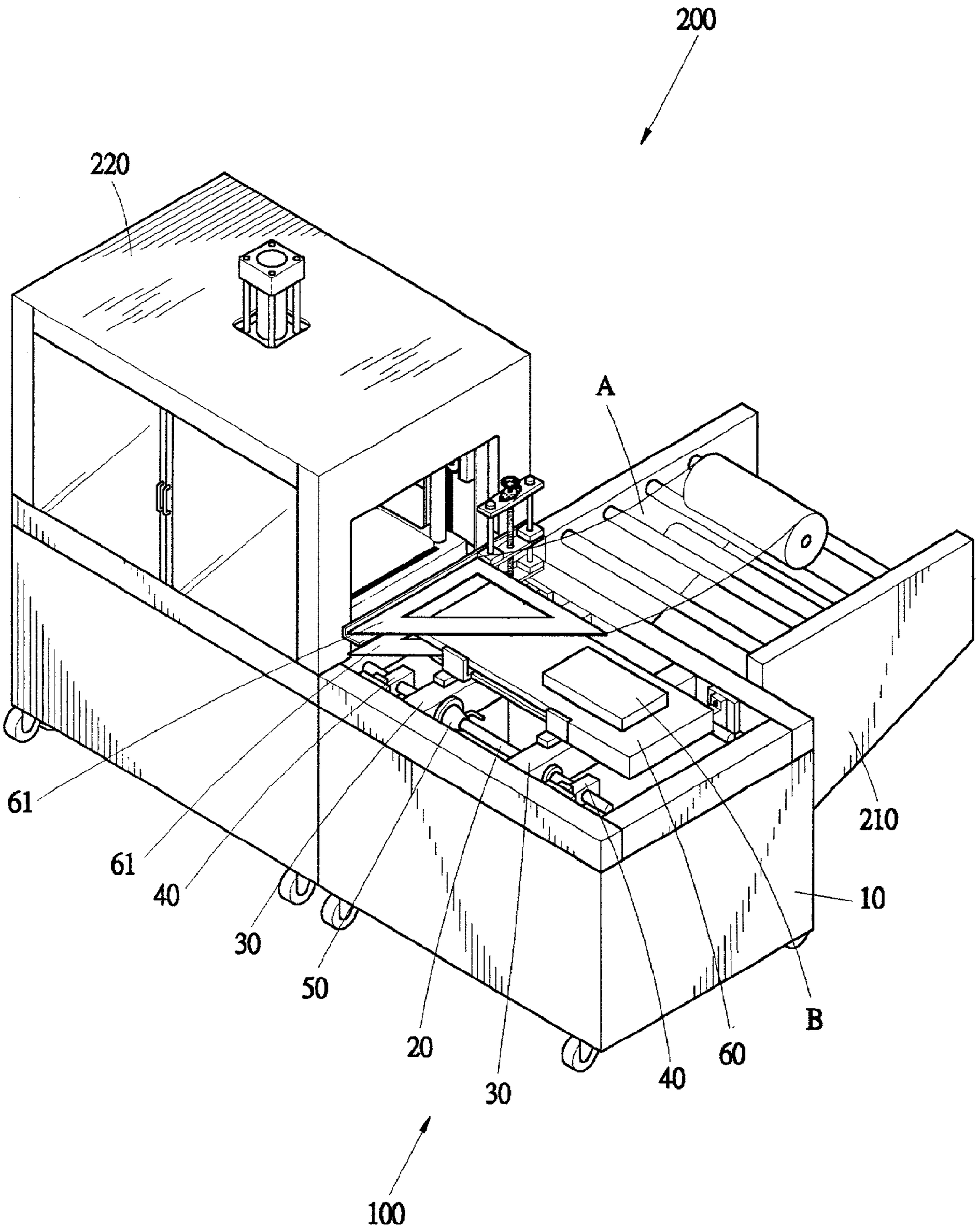


FIG.1

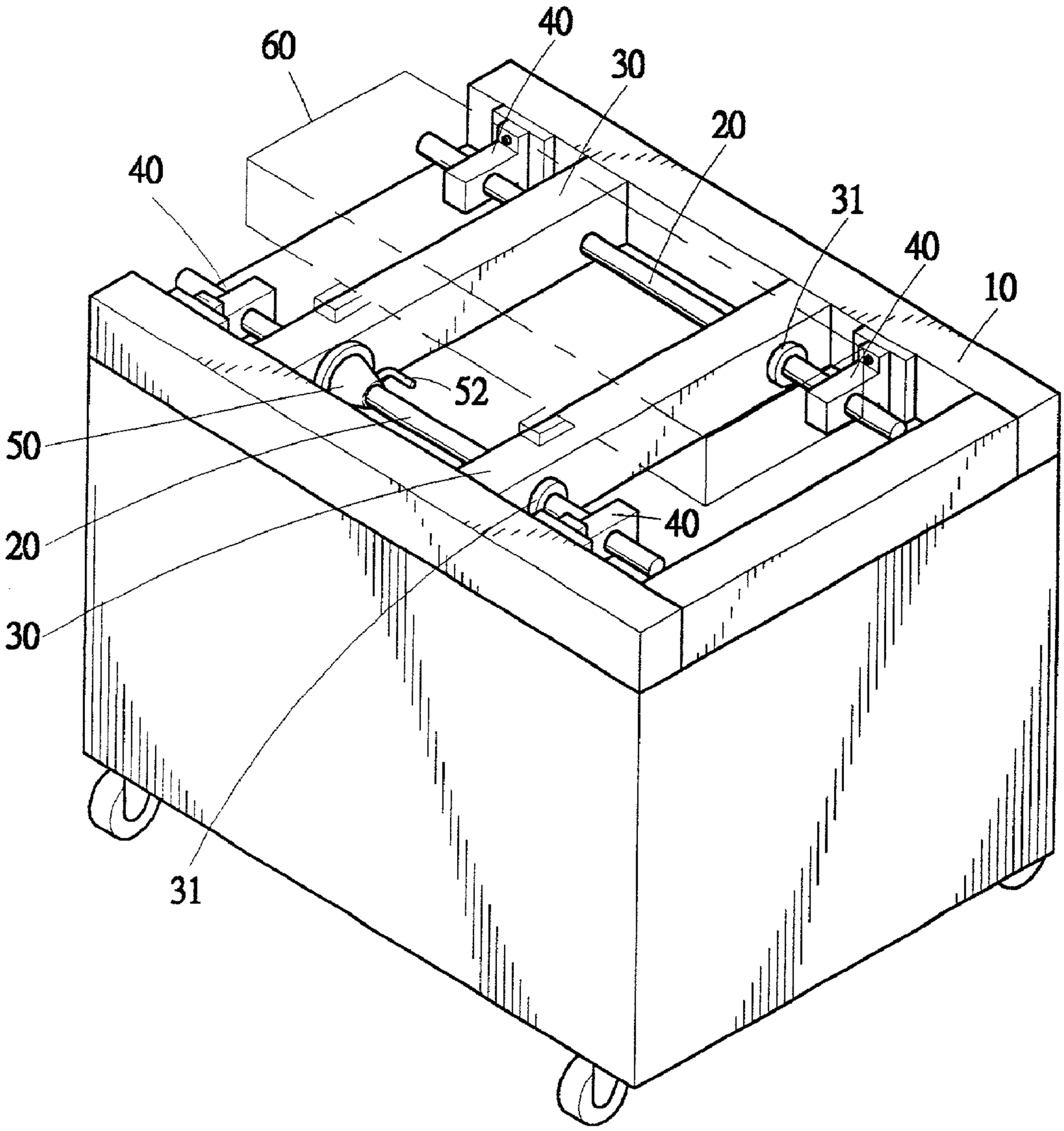


FIG.2

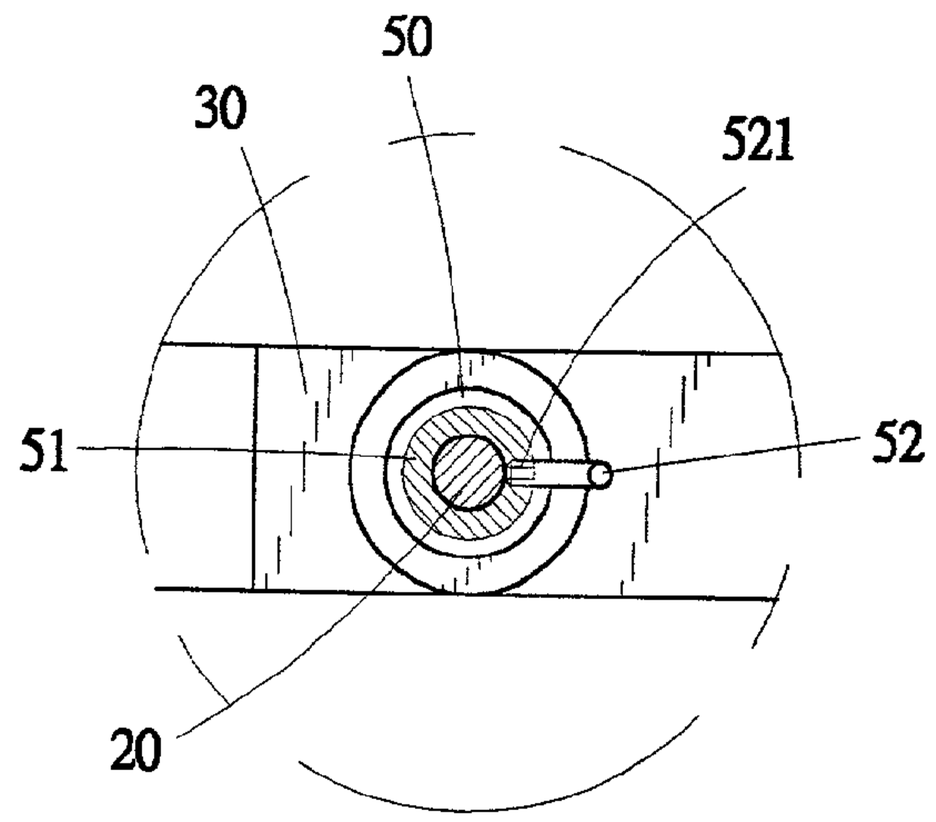


FIG.3

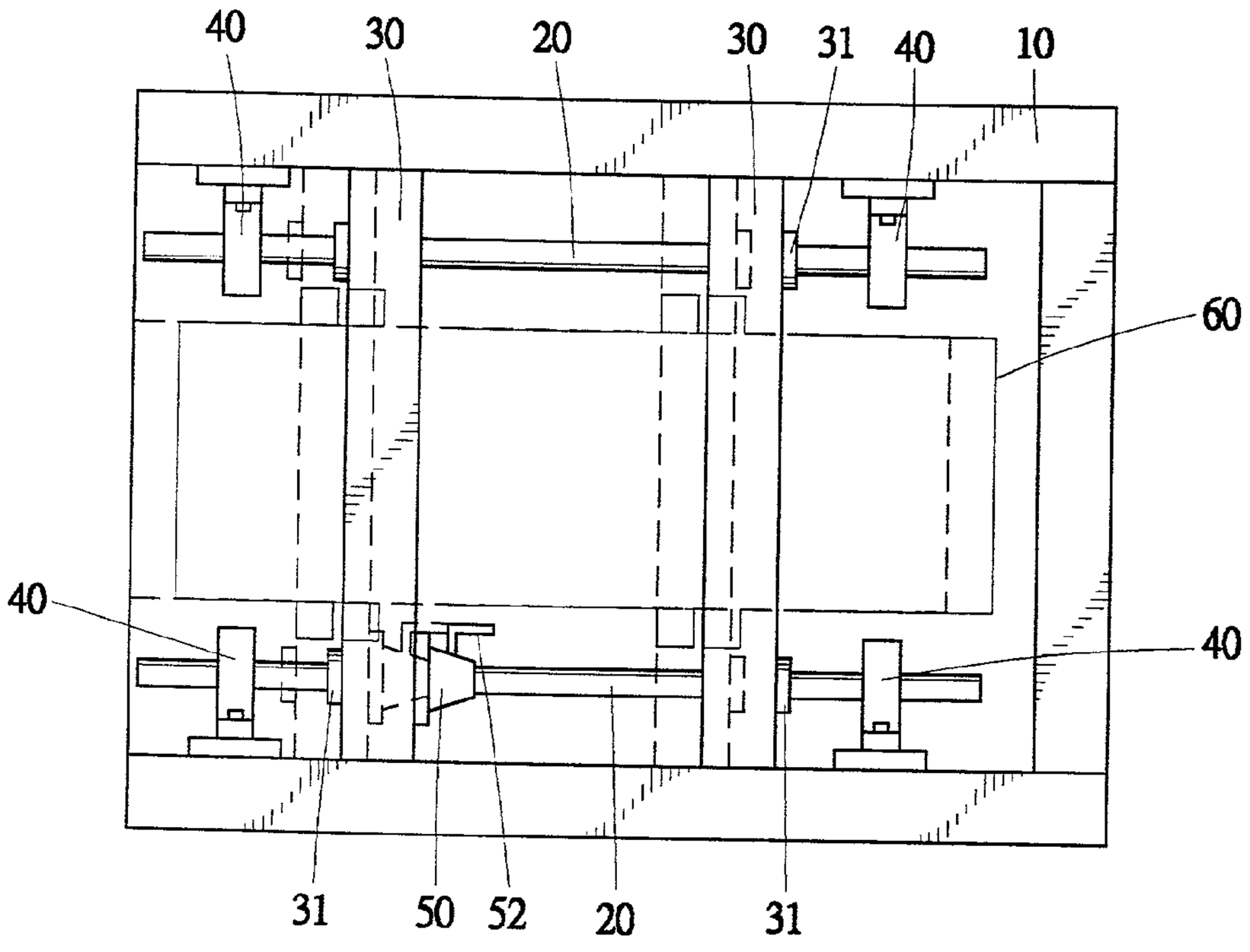


FIG.4

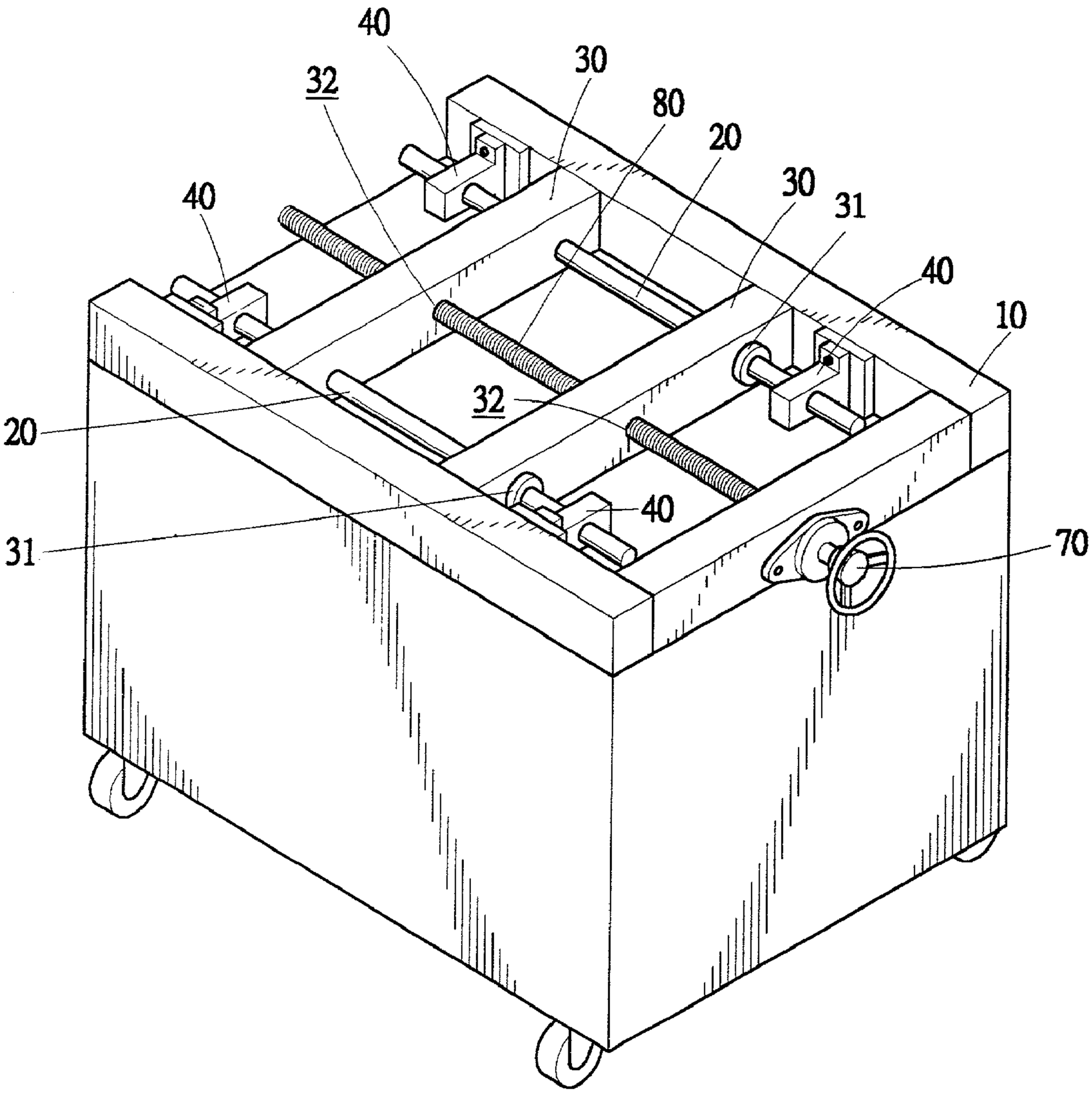


FIG.5

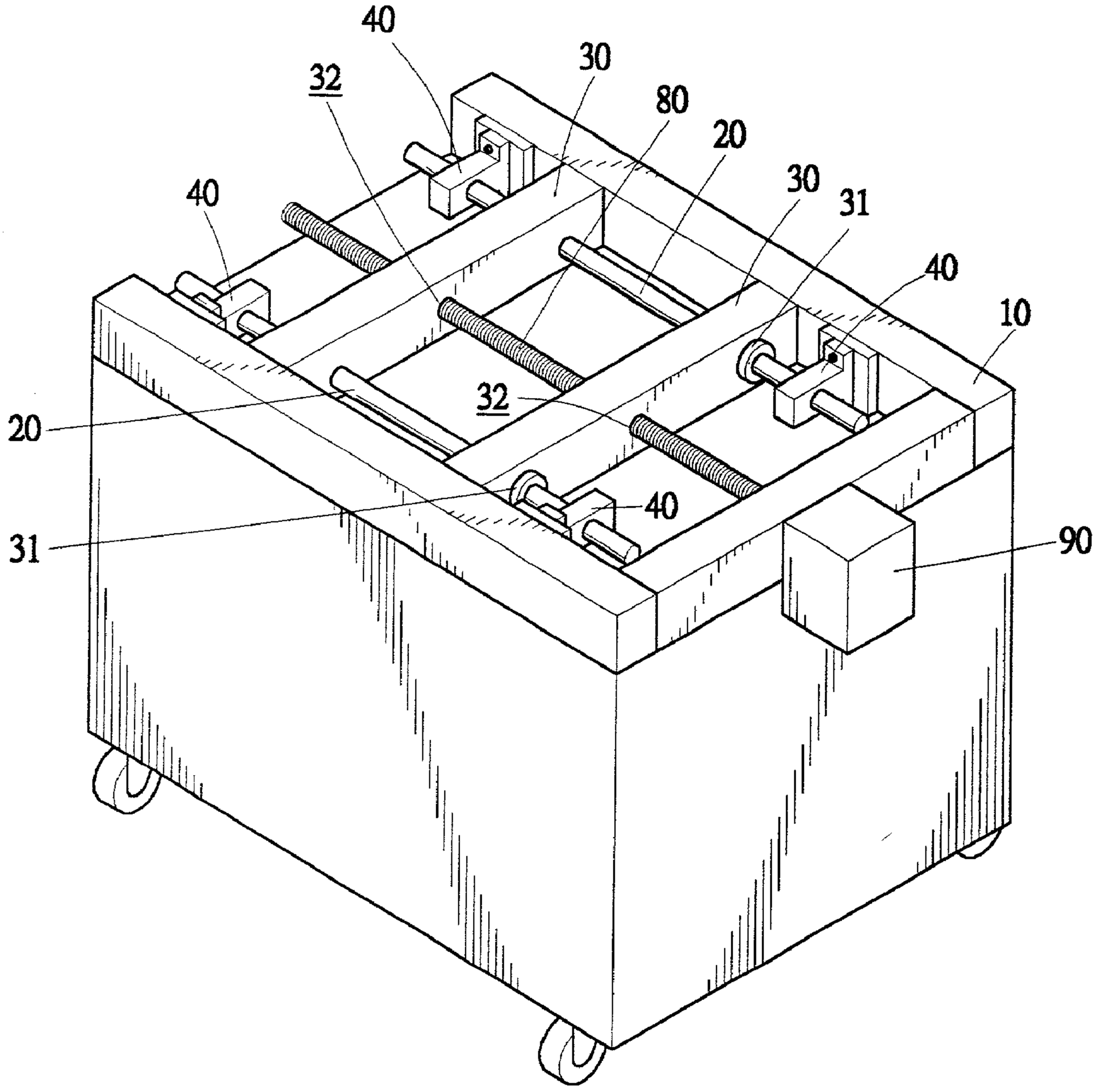


FIG.6

PACKAGE FILM TENSION ADJUSTING DEVICE OF PACKAGING MACHINE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates generally to a packaging machine, and in particular to a device for adjusting the tension of a package film supplied into the packaging machine for packaging a product.

[0003] 2. The Related Art

[0004] Plastic films have been widely used to wrap and pack consumer products, such as foods, books, video/audio compact disks for protecting the products from contamination and damage. A packaging machine is required to warp the package film around the product. The package film that is wrapped around the product is then heated along sealing line to seal the package film around the product so as to completely enclose the product with the package film.

[0005] The package film is commonly supplied in the form of a roll whereby the package film is unwound and supplied from the roll in a continuous manner. Due to the potential difference between the speed of the package film unwound from the roll and the speed by which the products to be packaged are conveyed, the package film may be over-tensioned or under-tensioned, resulting in poor quality of packaging. When the package film is over-tensioned, the product wrapped by the package film may undergo undesired deformation. In addition, the sealing line may not be able take the tension and thus break. When the package film is under-tensioned, the product cannot be properly wrapped and protected.

[0006] Thus, it is desired to have a package film tension adjusting device for properly tensioning the package film in a package machine so as to overcome the above problems.

SUMMARY OF THE INVENTION

[0007] An object of the present invention is to provide a package film tension adjusting device for a packaging machine wherein the tension of the package film fed into the packaging machine is properly adjusted.

[0008] Another object of the present invention is to provide a package film tension adjusting device that allows a stepless adjustment of the film tension that is fed into a packaging machine.

[0009] A further object of the present invention is to provide a package film tension adjusting device comprising a locker unit to secure the adjusting device in a desired position to maintain the tension of the package film supplied to a packaging machine.

[0010] To achieve the above objects, in accordance with the present invention, there is provided a package film tension adjusting device adapted to be arranged between a supply of a package film and a wrapping/sealing section of a packaging machine. The package film tension adjusting device includes a chassis inside which two rails are fixed. Two slide blocks are movably supported on the rails and are movable toward/away from the wrapping/sealing section along the rails. A conveyor is supported on the slide blocks for conveying products to be packaged into the wrapping/sealing section. Film routing members are attached to the conveyor for routing the package film toward the wrapping/sealing section. Moving the slide blocks along the rails causes the distance between the film routing members and the wrapping/sealing section to be changed thereby changing the tension of the package film supplied from the film routing members to the wrapping/sealing section in a stepless manner. A locker unit is mounted to at least one of the slide blocks for releasably securing the slide block at a desired position along the rails. A screw rod threadingly engages the slide blocks for moving the slide blocks along the rails.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention will be apparent to those skilled in the art by reading the following description of preferred embodiments thereof, with reference to the attached drawings, in which:

[0012] **FIG. 1** is a perspective view of a packaging machine in which a package film tension adjusting device constructed in accordance with a first embodiment of the present invention is incorporated;

[0013] **FIG. 2** is a perspective view of the package film tension adjusting device of the present invention;

[0014] **FIG. 3** is an enlarged view of a locker unit of the package film tension adjusting device of the present invention;

[0015] **FIG. 4** is a top view of the package film tension adjusting device of the present invention showing a film tension adjustment operation carried out thereby;

[0016] **FIG. 5** is a perspective view of a package film tension adjusting device constructed in accordance with a second embodiment of the present invention; and

[0017] **FIG. 6** is a perspective view of a package film tension adjusting device constructed in accordance with a third embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0018] With reference to the drawings and in particular to **FIG. 1, a** packaging machine, generally designated with reference numeral **200**, comprises a film supply section **210** from which a package film A in the form of a roll is continuously supplied and a wrapping/sealing section **220** inside which a product B is wrapped with the package film A. A package film tension adjusting device constructed in accordance with a first embodiment of the present invention, generally designated with reference numeral **100**, is arranged between the film supply section **210** and the wrapping/sealing section **220**.

[0019] In the embodiment illustrated, the film supply section **210** has a first longitudinal direction along which the film A is forwarded. The wrapping/tensioning section **220** has a second longitudinal direction along which the product B is conveyed. The first and second longitudinal directions are arranged to be substantially normal to each other. However, it is understood that the first and second longitudinal directions can be arranged in different way.

[0020] The package film tension adjusting device **100** comprises a chassis **10** inside which two spaced rails **20** are

fixed. The rails **20** can be of any known type and are cylindrical rods in the embodiment illustrated. Two slide blocks **30** are movably supported on the rails **20** by bearing means **31** whereby the slide blocks **30** are movable along the rails **20**. Stops **40** are arranged on opposite ends of the rails **20** for limiting the movement of the slide blocks **30** along the rails **20**.

[**0021**] Also referring to **FIG. 3, a** locker unit **50** is mounted to at least one of the slide blocks **30** to releasably secure the slide block **30** at any desired location along the rails **20**. The locker unit **50** comprises a collar **51** movably fit over one of the rails **20**. A radially-extending, inner-threaded hole (not labeled) is defined in the collar **51** for threadingly engaging a threaded section **521** of a handle **52**. The handle **52** allows a user to tighten the threaded section **521** with the inner-threaded hole of the collar **51** whereby a tip of the handle **52** engages the rail **20** to secure the slide block **30** is position.

[**0022**] A conveying device **60**, such as a belt conveyor, is mounted on and carried by the slide blocks **30** for conveying the product B to be packaged into the wrapping/sealing section **220**. The conveying device **60** comprises a pair of film routing members **61** arranged above and below the conveying device **60** respectively for changing the moving direction of the package film A so as to feed the package film A into the wrapping/sealing section **220**. The conveying device **60** and the film routing members **61** are both known and thus no further detail is needed herein unless it is associated with the description of the present invention.

[**0023**] Also referring to **FIG. 4**, to operate, the locker unit **50** is released and the slide blocks **30** are moved along the rails **20** in a desired direction toward or away from the wrapping/sealing section **220** as indicated by dashed lines of **FIG. 4**. The movement of the slide blocks **30** relative to the wrapping/sealing section **220** changes the distance between the wrapping/sealing section **220** and the film routing members **61** thereby changing the tension of the package film A supplied from the film routing members **61** to the wrapping/sealing section **220**. Since the slide blocks **30** are slidable along the rails **20**, the distance between the wrapping/sealing section **220** and the film routing members **61** is adjusted in a stepless manner.

[**0024**] The locker unit **50** can be re-secured by rotating the handle **52** after the slide blocks **30** are moved to the desired position where the tension of the package film A is properly set. Securing the locker unit **50** prevents the slide blocks **30** and thus the conveying device **60** and the film routing members **61** from undesired movement along the rails **20** thereby effectively maintaining the tension of the package film A.

[**0025**] **FIG. 5** shows a package film tension adjusting device constructed in accordance with a second embodiment of the present invention wherein a screw rod **80** threadingly engages inner-threaded holes **32** defined in the slide blocks **30**. A hand wheel **70** is mounted to an end of the screw rod **80** for rotation of the screw rod **80**. The rotation of the screw rod **80** causes the slide blocks **30** and thus the conveying device **60** and the film routing members **61** to move along the rails **20** whereby the distance between the routing members **61** and the wrapping/sealing section **220** is changed.

[**0026**] **FIG. 6** show a package film tension adjusting device constructed in accordance with a third embodiment which is a modification of the second embodiment wherein the hand wheel **70** of the second embodiment is replaced by an electric motor **90**. The operation of the electric motor **90** causes the screw rod **80** to rotate which leads to the movement of the slide blocks **30** along the rails **20** thereby changing the distance between the film routing members **61** and the wrapping/sealing section **220** and thus the tension of the package film A fed into the wrapping/sealing section **220**.

[**0027**] The package film tension adjusting device of the present invention offers at least the following advantages:

[**0028**] (1) The stepless movement of the slide blocks **30** along the rails **20** allows the distance between the wrapping/sealing section **220** and the film routing members **61** to be changed in a stepless manner. The tension of the package film A that is fed into the wrapping/sealing section **220** by the film routing members **61** can thus be adjusted in a stepless manner whereby a proper tension of the package film A can be obtained for high quality package of the product B.

[**0029**] (2) The package film tension adjusting device **100** has a simple structure and thus low costs but is capable to achieve a precise adjustment of the film tension in a stepless manner. No sophisticated electronics is necessary and no calculation is required.

[**0030**] (3) The simple structure of the package film tension adjusting device **100** of the present invention allows it to be readily incorporated into both automatic packaging machines and semi-automatic packaging machines.

[**0031**] Although the present invention has been described with reference to the preferred embodiments thereof, it is apparent to those skilled in the art that a variety of modifications and changes may be made without departing from the scope of the present invention which is intended to be defined by the appended claims.

What is claimed is:

1. A package film tension adjusting device adapted to be mounted between a supply of a package film and a wrapping/sealing section of a packaging machine, the package film tension adjusting device comprising rails on which slide blocks are movably supported for being movable relative to the wrapping/sealing section and thus changing distance therebetween, film routing means being mounted on the slide blocks to be movable therewith, the package film being fed into the wrapping/sealing section by the film routing means whereby moving the slide blocks along the rails changes the distance between the film routing means and the wrapping/sealing section and thus tension of the package film supplied from the film routing means to the wrapping/sealing section.

2. The package film tension adjusting device as claimed in claim 1 further comprising stops arranged at opposite ends of the rails for limiting the movement of the slide blocks along the rails.

3. The package film tension adjusting device as claimed in claim 1 further comprising a locker unit associated with at least one of the slide blocks for releasably securing the slide blocks at a desired position along the rails.

4. The package film tension adjusting device as claimed in claim 3 wherein the locker unit comprises a collar slidably fit over one of the rails, an inner-threaded hole being defined

in the collar for threadingly engaging a threaded section of a handle, the handle having an inner tip selectively engaging the rail for securing the slide block at the desired position along the rail.

5. The package film tension adjusting device as claimed in claim 1 further comprising bearing means mounted between the slide blocks and the rails.

6. The package film tension adjusting device as claimed in claim 1 further comprising a screw rod threadingly engaging inner-threaded holes defined in the slide blocks whereby rotation of the screw rod causes movement of the slide blocks along the rails.

7. The package film tension adjusting device as claimed in claim 6 further comprising a device for rotating the screw rod.

8. The package film tension adjusting device as claimed in claim 7, wherein the device for rotating the screw rod comprises a hand wheel.

9. The package film tension adjusting device as claimed in claim 7, wherein the device for rotating the screw rod comprises an electric motor.

* * * * *