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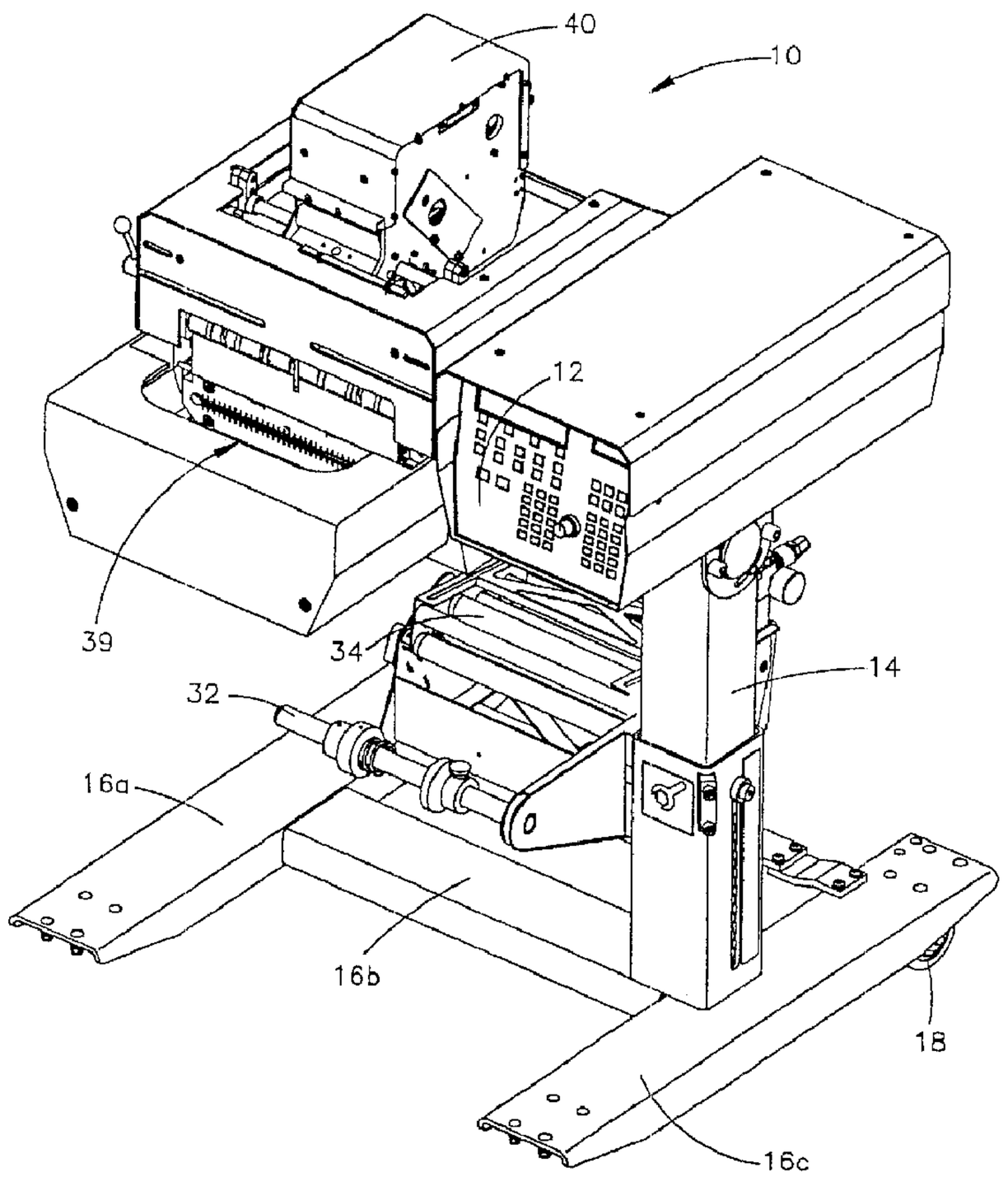
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(54) Titre : MACHINE ET PROCEDE D'ENSACHAGE UNITAIRE
(54) Title: INDIVIDUAL PACKAGE BAGGER AND PROCESS



(57) Abrégé/Abstract:
A machine for forming individual packages from a web of preopened and interconnected bags one at a time is disclosed. A web is fed along a path of travel from a supply to a load station. A pair of nip rolls are positioned along the path near the load station. A

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(57) Abrégé(suite)/Abstract(continued):
printer is positioned along the path between the supply and the nip rolls. A nip roll drive is provided for rotating the nip rolls selectively and one at a time at a printing rate for the feed of the web when the printer is operating and at a faster feed rate for positioning a bag at the load station when the printer is not operating. A supply station tensioner is provided for tensioning a web along the path such that the printer when operating prints a section of a tensioned web.

ABSTRACT

A machine for forming individual packages from a web of preopened and interconnected bags one at a time is disclosed. A web is fed along a path of travel from a supply to a load station. A pair of nip rolls are positioned along the path near the load station. A printer is positioned along the path between the supply and the nip rolls. A nip roll drive is provided for rotating the nip rolls selectively and one at a time at a printing rate for the feed of the web when the printer is operating and at a faster feed rate for positioning a bag at the load station when the printer is not operating. A supply station tensioner is provided for tensioning a web along the path such that the printer when operating prints a section of a tensioned web.

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INDIVIDUAL PACKAGE BAGGER AND PROCESS

This invention relates to packaging machines and more particularly to a packaging machine especially designed for packaging quantities of materials to fill individual orders and the process of filling such orders.

BACKGROUND

Machines that use webs of pre-opened bags to form packages are now well known. Such webs of bags are disclosed and claimed in the U.S. patent 3,254,828 entitled Flexible Container Strips (the Autobag Patent). A machine which is currently in wide usage commercially for forming packages from chains of pre-opened bags utilizing a novel web tensioning dancer mechanism is described and claimed in U.S. Patent 5,394,676 issued March 7, 1995 to Bernard Lerner et al. under the titled Packaging Machine and Method (the Excel Patent). Machines made in accordance with the teaching of the Excel Patent often are supplied parts to be packaged by modular systems of counters and/or weighers and conveyors in order that packages can be formed automatically and at relatively high speeds.

The Excel machines are often equipped with printers such as described and claimed in patent 5,371,521 issued December 6, 1994 to Rick S. Wehrmann (the Teeter Totter Patent). The machine of the Teeter Totter Patent is designed to print identical information on each bag in a chain of interconnected bags. The Teeter Totter Patent is directed to a mechanism which tensions the chain of bags and feeds it past a print head in a printing section of a chain of bags. The printing section is tension isolated from a supply section which supplies the chain and also from a downstream section which delivers bags to a load station such that the three sections are independently tensioned.

The Excel Patent teaches a dancer mechanism which independently tensions the supply section upstream from the printer section while a conveyor system effects tensioning of the downstream section. These mechanisms produce the three isolated, individually tensioned sections along the feed path of an Excel machine.

Relatively large "mail order" and “e-business” organizations require systems for filling individual orders. An example is organizations which fill individual orders for

pharmaceuticals. Such pharmaceutical organizations typically utilize so called wicketed bags for packaging individual orders for shipment offsite to customers. Pressure sensitive labels are used to identify the contents of each bag and to provide an address for shipment of each filled bag to a customer at an offsite location. The wicketed bag approach is slow and expensive. For pharmaceutical shipment it is especially expensive in that only registered pharmacists can fill individual bags with pharmaceutical orders so that each load station must have an assigned pharmacist.

A machine which is a modified version of a packaging machine competitive with the Excel machine is currently being offered for sale. This modified machine has what has been characterized as a ditch to receive and accumulate each bag in an untensioned loop after it has been printed but before it is fed to a load station. This results in printing errors and wrinkling of bags such that finished packages are not as attractive as they should be and lost shipments can result from printing errors.

Accordingly it would be desirable to provide a machine which uses a web of pre-opened bags for packaging individual orders and which prints identifying information on an upstream tensioned bag as a previously printed bag is loaded with its appropriate batch of pharmaceuticals and sealed.

SUMMARY OF THE INVENTION

Figure 1 is a perspective view of a bagging machine of the type disclosed and claimed in the Excel patent and modified in accordance with the present invention;

Figure 2 is a somewhat schematic view of the machine of Figure 1 showing the web feed path through the machine; and,

Figure 3 is a view showing the printer, the printhead and its coaction with web feed and support rolls.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to the drawings and Figure 1 in particular, a bagging machine is shown generally at 10. A machine control 12 is connected to the bagger 10. The bagger and the control are mounted on a post 14 which in turn is mounted on a wheeled base 16 to support the bagger and control cantilever fashion over the base. The base includes two wheeled side arms 16a, 16c connected by a cross member 16b. Four wheels 18 are provided to facilitate

movement of assembly to desired locations.

As shown schematically in Figure 2, a roll 28 of an elongate web bags is mounted on the post 14 by a mandrel 32. The roll 28 is a wound web 30 of preopened bags of the type sold commercially under the trademark Autobag by the Assignee of this patent.

The web 30 is fed from the supply roll 28 through a servo dancer mechanism 34. The web is fed upwardly from the dancer mechanism over a guide roll 35 toward the rear of the bagger 10 and thence forwardly through a pair of nip rolls 36, 38 to a load station 39.

A printer 40 is provided. The printer includes a print head 42 which coacts with a print roll 44. The print roll 44 is drivingly connected to the nip roll 38 by a belt 46. The belt 46 engages the rolls in respective grooves which are sized such that the rolls 38, 44 rotate with the same surface speed. Like surface speeds of the rolls avoids wrinkling of the web as is fed forward and backward between the nip rolls 36, 38.

OPERATION

In operation the nip rolls 36 are counter rotated to feed the web 30 until a previously printed end bag 48 is positioned at the load station 39, Figure 2. After a product has been inserted into the end bag, a seal mechanism shown schematically at 50 is closed. The seal mechanism is that described and claimed in the Excel patent. While the end bag is being sealed the nip rolls are counter rotated to reverse feed the web and separate the end bag 48 from the web. If the next bag requires a substantial amount of printing, the reverse feeding is continued until the print head 42 is positioned at a desired relative position along the next bag for effecting printing of information. Typical in formation will include identification of the items to be packaged and the name and address of the intended recipient of the packages.

As the web 30 is reverse fed for bag separation and positioning of the next bag for printing, tension is maintained on the web by the dancer mechanism 34. To this end a stepper motor 52 of the dancer mechanism reverses the rotation of dancer feed rolls 54, Figure 2 to maintain constant web tension all in a matter fully described in the Excel patent. Once printing commences the nip and print rolls are rotated relatively slowly to advance the web as it is printed. After the printing has concluded and the end bag has been discharged from the sealer, the rolls are rotated at a faster speed to quickly deliver the newly printed bag to the

load station and advance a further bag to the print station. Electronic controls for the operation of the machines are described more fully in U.S. Patent 5,341,625 entitled Bagging Control Apparatus and Method Issued August 30, 1994.

Although the invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction, operation 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.

CLAIMS:

1. A process of packaging products to fill individual orders comprising:

a) feeding a web of interconnected preopened bags along a path of travel from a supply to a load station and closing the bags to fill an order;

b) forming a package by inserting a product into an opened bag at the load station to fill an order;

c) tensioning a web section upstream from nip rolls for feeding the load station; and

d) while the package being formed is at the load station imprinting another bag in the tensioned web section with at least a portion of identifying information for another order, wherein the tensioned section is reverse fed along the path prior to the imprinting step.

2. The process of claim 1, wherein the required identifying information for said another order is imprinted while the package is being formed at the load station.

3. The process of claim 1, wherein the web section is tensioned by a powered dancer mechanism positioned along the path near the supply.

4. The process of claim 1, wherein the product is a pharmaceutical.

5. A process of packaging individual discrete orders comprising:

a) feeding a web of interconnected pre-opened bags along a path of travel from a supply then through a dancer thence to and through a printing station to a load station;

b) using the dancer to tension the web at least in the printing station;

c) printing identifying indicia for a specific order on one of the pre-opened bags positioned at the printing station;

d) further feeding the web to position the printed bag at the load station and a further bag at the printing station;

e) opening the printed bag and filling it with contents required for the specific order while the printed bag is at the load station;

f) closing the printed and filled bag and separating it from the web;

g) printing the further bag concurrently with at least a portion of the performance of step f on the printed bag;

h) repeating steps d through g to fill, close and separate the further bag and to print, fill, close, and separate still further bags.

6. The process of claim 5, wherein the bag separation step including reverse feeding the web by driving nip rolls in a reverse direction while the dancer absorbs slack in the web to maintain web tension.

7. The process of claim 6, wherein the reverse feeding is to an extent needed to provide adequate bag surface area for printing the bag then at the printing station.

8. The process of claim 7, wherein the reverse feeding is also effective to separate a loaded bag at the load station from the web.

9. The process of claim 5, wherein the bag separation step includes reverse feeding the web by driving nip rolls in a reverse direction while the dancer absorbs slack in the web to maintain web tension, the reversal serving to effect separation of a loaded bag from the web.

10. A machine for forming packages from a web of preopened and interconnected bags comprising:

a) structure defining a supply station for receiving a supply of interconnected bags;

b) other structure delineating a load station and a path of travel from the supply station to the load station;

c) a pair of nip rolls positioned along the path and near the load station;

d) the nip roll pair being disposed on opposite sides of the path for driving engagement with the web;

e) a printer positioned along the path between the supply station and the nip rolls;

f) a nip roll drive for rotating the nip rolls selectively and one at a time at a printing rate for feed of the web when the printer is operating and at a faster feed rate for positioning a bag at the load station when the printer is not operating;

g) a supply station tensioner is positioned downstream from the supply and includes a mechanism for tensioning a web along the path the tensioner to the nip rolls such that the printer when operating prints a section of a tensioned web;

h) the tensioner being adapted to establish web tension both when the nip rolls are rotated in a feed and in a reverse direction; and wherein the printer is provided with a print roll, the print roll and nip rolls are of differing diameter and the drive is coupled to both nip rolls and the print roll to cause concurrent rotation of the nip and print rolls at equal surface speed.

11. The machine of claim 10, wherein the supply station tensioner maintains a length of web under tension between the supply station and the nip rolls such that when the printer is operated to print a part of the such length of web, the length of web is under tension.

12. The machine of claim 10, wherein the drive is connected to the print roll by a pulley and belt arrangement.

13. A process of packaging products to fill individual orders comprising:

a) feeding a web of interconnected preopened bags along a path of travel from a supply to and through nip rolls to a load station and whereat the bags are successively filled and closed to fill orders;

b) forming a package by inserting a product into an opened bag at the load station to fill an order;

c) tensioning a web section between an upstream dancer mechanism and the nip rolls, the dancer mechanism being proximate the supply; and,

d) while the package being formed is at the load station imprinting an end bag adjacent the nip rolls in the tensioned web section with at least a portion of identifying information for another order, said another order being the next order to be filled and the end bag having been connected to the opened bag.

14. The process of claim 13, wherein the tensioned section is reverse fed along the path prior to the imprinting step.

15. The process of claim 13, wherein the web section is reverse fed along the path prior to the imprinting step.

16. The process of claim 13, wherein the product is a pharmaceutical.

17. A process of packaging individual discrete orders comprising:

a) feeding a web of interconnected pre-opened bags along a path of travel from a supply then through a dancer thence to and through a printing station to a load station;

b) using the dancer to tension a section of the web in the printing station;

c) printing identifying indicia for a specific order on one of the pre-opened bags included in the section and positioned in the printing station;

d) further feeding the web to position the printed bag at the load station and a further bag at the printing station, the further bag being directly connected and adjacent to the printed bag;

e) opening the printed bag and filling it with contents required for the specific order while the printed bag is at the load station;

f) closing the printed and filled bag and separating it from the further bag and the web;

g) printing the further bag concurrently with at least a portion of the performance of the opening, filling, closing and separating steps on the printed bag; and,

h) repeating steps d through g to fill, close and separate the further bag and to print, fill, close and separate still further bags.

18. The process of claim 17, wherein the bag separation step including reverse feeding the web by driving web feeding nip rolls in a reverse direction while the dancer reverses movement of the tensioned section along the path of travel to absorbs slack in the web and maintain web tension in the section.

19. The process of claim 18, wherein the reverse feeding is to an extent needed to provide adequate bag surface area for printing the bag then at the printing station.

20. The process of claim 19, wherein the reverse feeding is also effective to separate a filled and closed bag at the load station from the web.

21. The process of claim 17, wherein the bag separation step includes reverse feeding the web by driving web feeding nip rolls in a reverse direction while the dancer absorbs slack in the web to maintain web tension in the section, the reversal serving to effect separation of a loaded bag from the web.

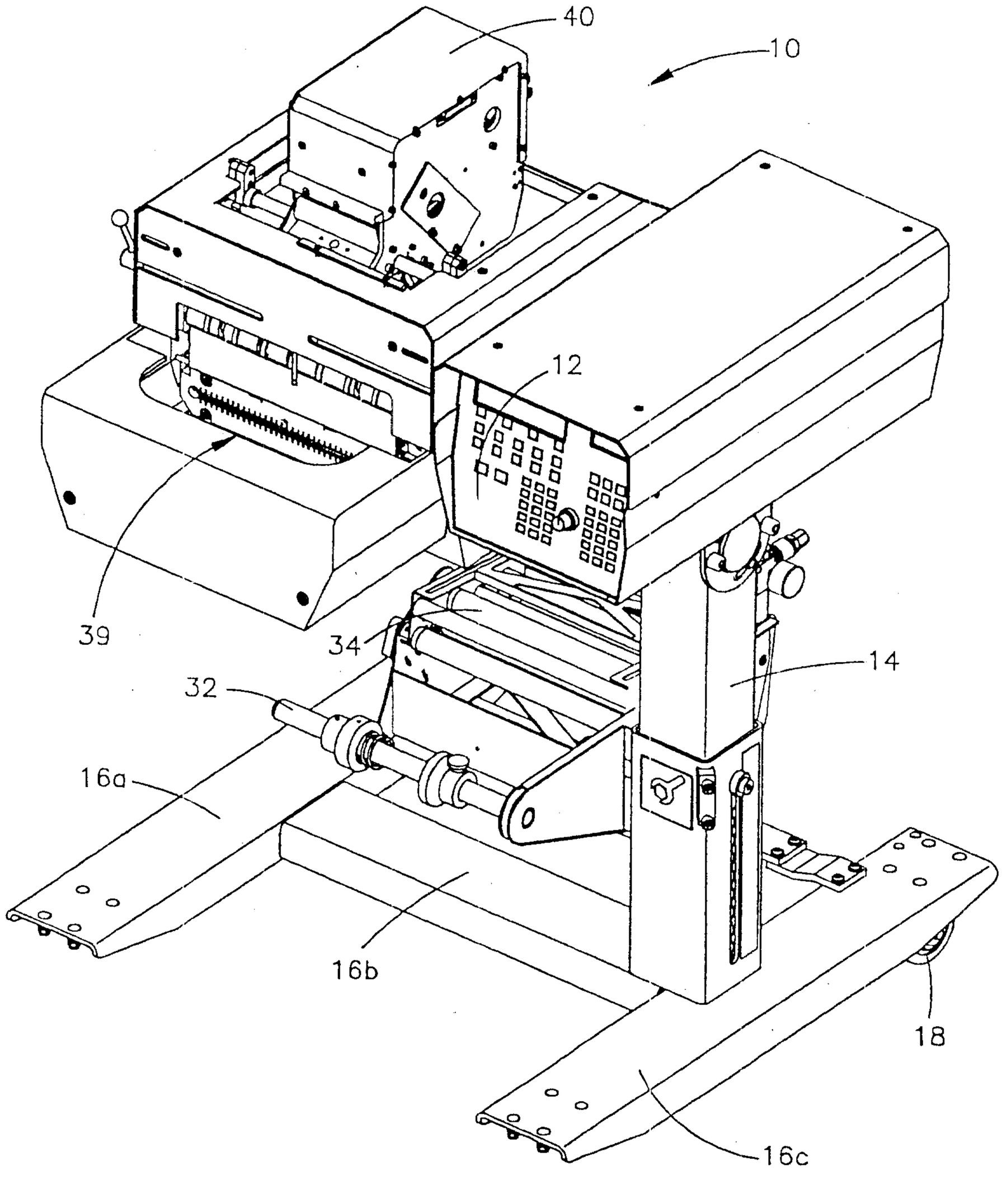


Fig.1

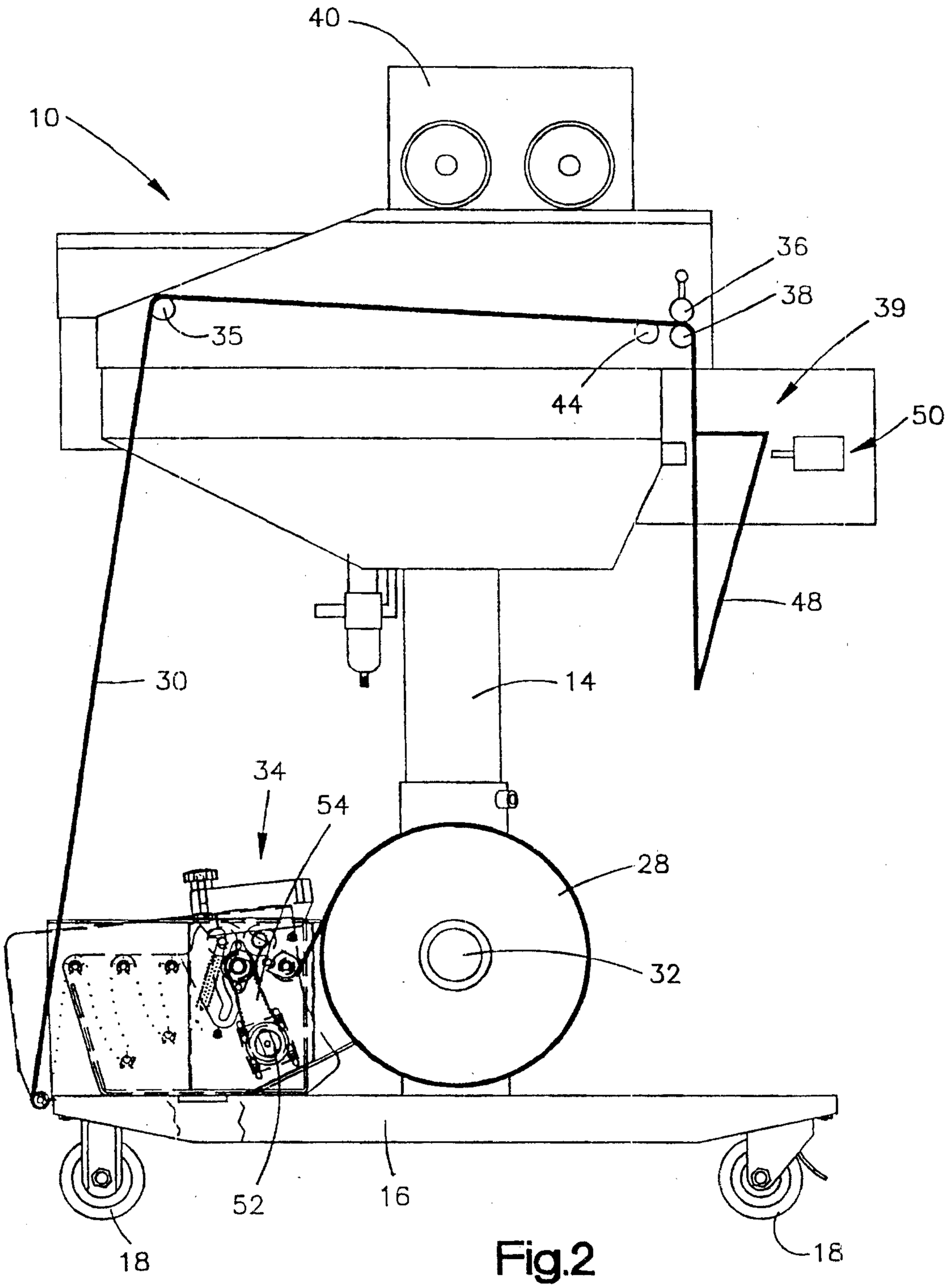


Fig.2

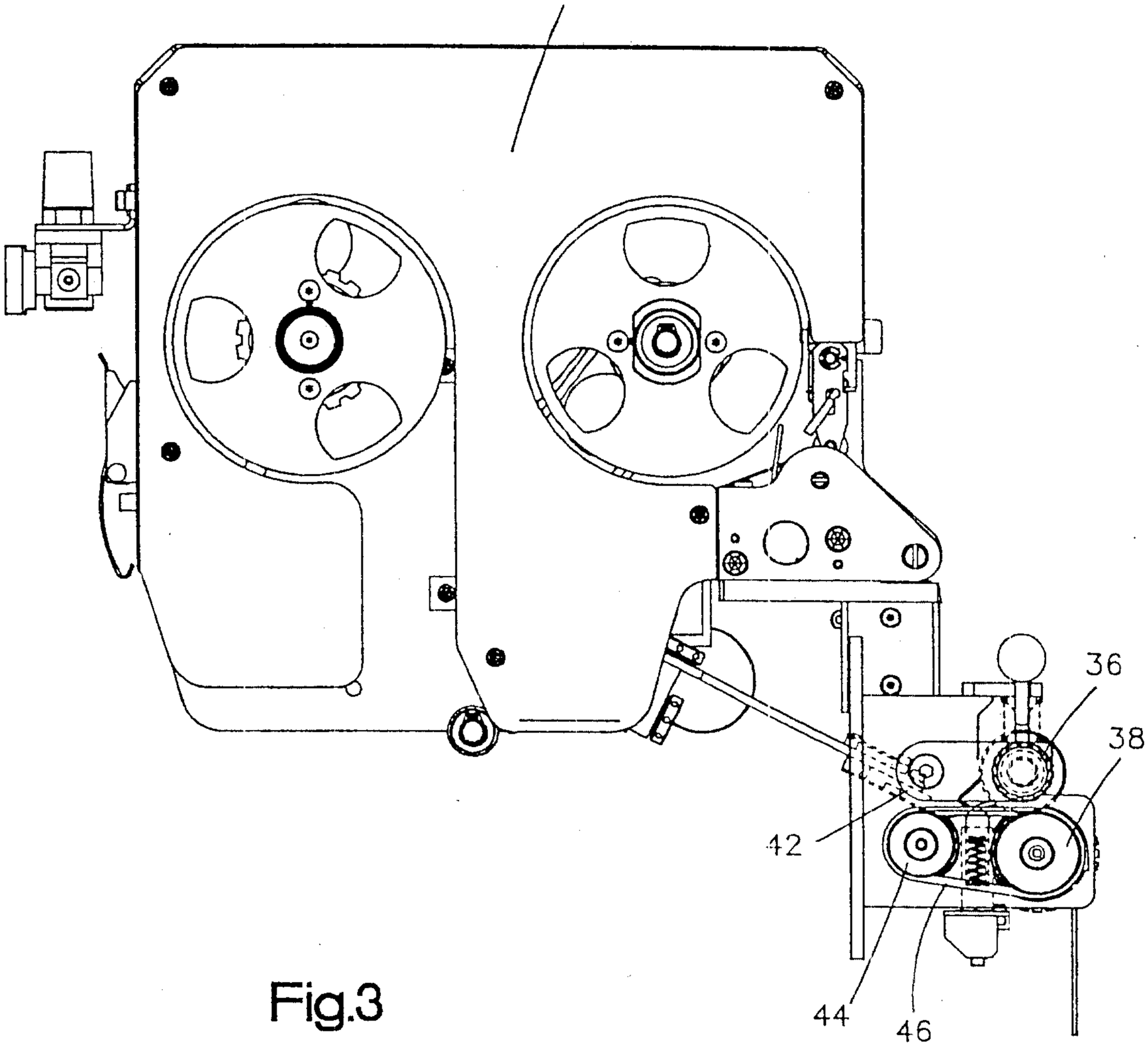
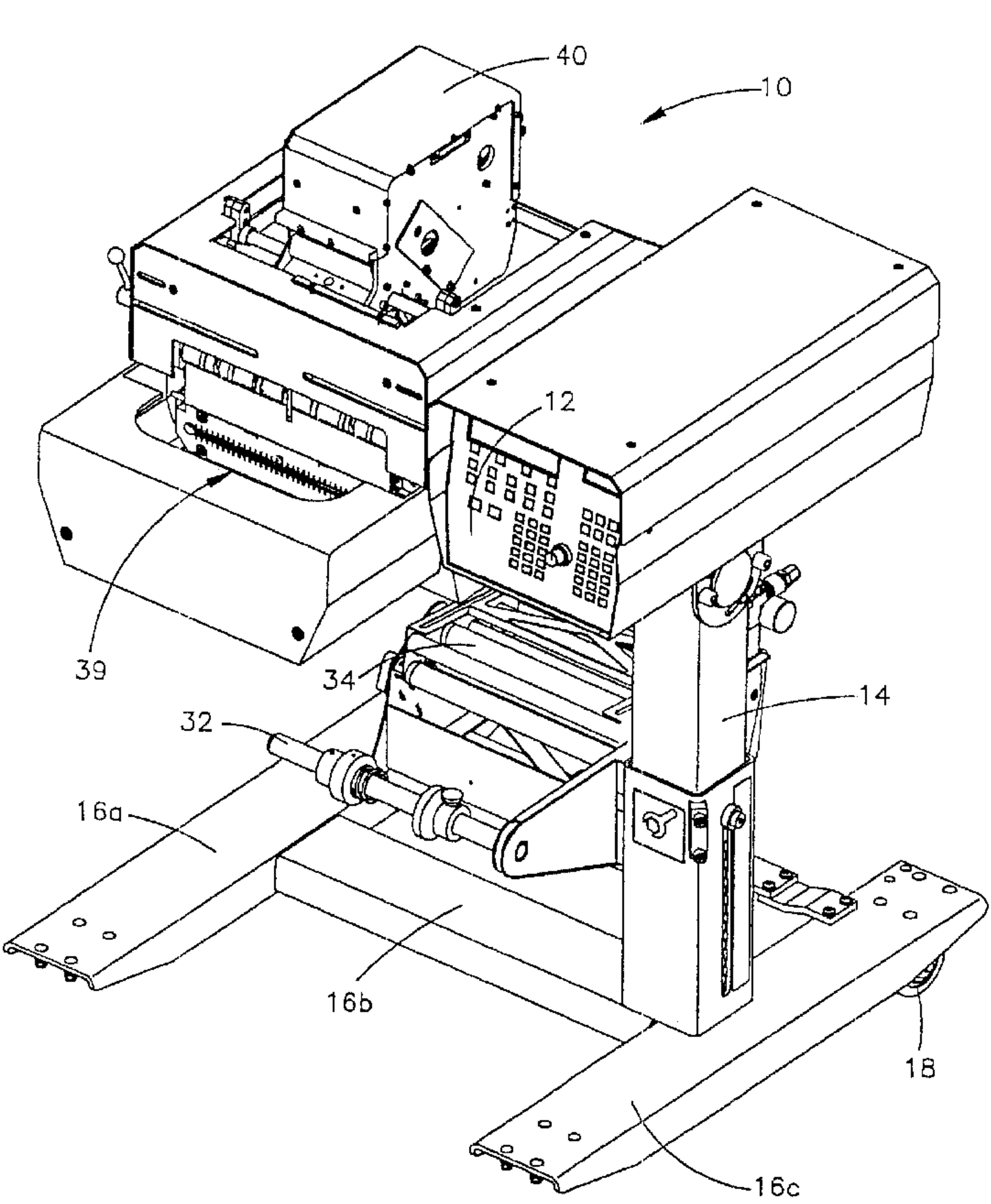


Fig.3


40
10
12
39
34
32
14
16a
16b
18
16c