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(72) Inventor: **Ferruccio, Patelli**
40133 - Bologna (IT)

(74) Representative: **Dall'Olio, Giancarlo**
Interbrevetti S.r.l.
Via del Cestello 13

Description

[0001] The present invention relates to a machine for packaging bulk articles or groups of articles in a tubular envelope or bag.

[0002] There are many known automatic machines that inserts articles or groups of single articles already packed, into an elongated side-sealed tube as it travels.

[0003] Usually, these machines fill the tube at the same time when they make it, and they form completed, sealed packages or bags, ready for the market, which contain a certain amount of product or a pre-established number of articles.

[0004] Packs containing more articles previously wrapped one by one, are also known as multi-packs.

[0005] Basically, these machines for obtaining the tube from a sheet of heat sealable material, include:

feeding means for supplying the continuous sheet material, which form a continuous tube to be filled and is subsequently severed crosswise to obtain separate packs or bags;

a sleeve, around which the continuous sheet material is placed to form the tube;

an outer collar for guiding the continuous sheet material around the sleeve and for shaping externally the tube being formed;

welding means for sealing the longitudinal continuous, facing-each-other or overlapped edges of the sheet material;

pulling means, which push the continuous sheet material against the sleeve and rotate so as to advance the sheet material;

means for feeding product or articles to be packaged, usually including a hopper fast

the continuous sheet 1 is unwound, and a series of turn-about rollers 6.

[0020] According to known techniques, the turnabout rollers 6 form a compensation mechanism, that compensate for slight differences between the quantity of the continuous sheet material unwound from the reel 2 and the quantity of the continuous sheet material actually used for forming the bags or packs.

[0021] The welding means include a heat welder of known type, which seals the longitudinal edges of the continuous sheet material in overlapped or folded and facing-each-other condition.

[0022] The tube portion longitudinally sealed and situated around the sleeve, will be hereinafter referred to as the envelope 3.

[0023] The continuous sheet material 1 is pulled by suitable means 18 including one or more motor powered endless belts, which press the continuous sheet 1 against the sleeve 11 for making it advance in direction A (Figure 1).

[0024] The figures show only one pair of endless belts 18, but obviously more pairs of endless belts can be provided, arranged along the sleeve circumference to increase the pulling action.

[0025] Cutting and welding means 30, situated at the bottom of the sleeve 11, include two heated plates 31, 32, which simultaneously seal and sever crosswise the tube 4, to seal and separate single packs or bags 5.

[0026] According to the invention, the sleeve 11, the collar 12, the welder 15 and the pulling endless belts 18 are mounted on an oscillating frame 7, which can rotate about a horizontal axis.

[0027] For sake of clarity, only the sleeve will be referred to in the following, but it is understood that the movements of the sleeve involve also all the other elements integral therewith.

sleeve due to the action of a linear actuator 36. Motion of the plate 44 in the introduction direction T moves the articles up to the bottom of the tube (Figures 3 and 4).

[0049] At the same time, the pad 46 is moved in push direction S, so as to press the wings 9 of the welded bottom 8, making it assume a flat shape.

[0050] As can be understood from Figure 4, when the plate 44 completes its stroke, a raising device 34 is operated to act on the end of the plate 44 remaining outside the sleeve 11, thus raising it a bit.

[0051] This raising is enough to slightly push the articles 41 against the inner upper wall of the sleeve 11 opposite to the plate 44, so, when the plate 44 is retracted with a withdrawing movement R (Figure 5), the articles 41 are held at the bottom of the sleeve 11.

[0052] At the same time, the pad 46 is moved in direction P.

[0053] Afterwards, the frame 7 is rotated, e.g. in direction F, to bring the sleeve 11 back to its vertical condition V (Figure 6).

[0054] During the return rotation in direction F, the curved member 45 hits the wings 9 of the envelope 3 to stabilise their folding.

[0055] When the sleeve reaches its vertical position V, the articles contained in its lower part settle on the bottom of the envelope 3, which begins to go down due to reactivation of the driving endless belts 18 that subsequently pull another strap of sheet material 1 from the reel 2. In this way, the envelope 3 containing the product or articles 41 passes beyond

said collar (12), and in that said sleeve (11), said collar (12), said pulling means (18) and said welding means (15) are mounted on an oscillating frame (7), which can rotate about a horizontal axis, so as to determine, according to alternative steps: a horizontal condition for said sleeve (11), during which said articles feeding means (40) introduce the product or articles (41) into said sleeve (11) bringing them to the bottom of said sleeve (11), with said pulling means (18) in stop configuration; and

a vertical condition (V) for said sleeve (11), in which condition said pulling means (18) and said cutting and welding means (30) are operated again to complete formation of the pack or bag (5) from said envelope (3).

2. Machine, according to claim 1, characterised in that it includes also folding means (45) acting on the bottom of the envelope (3) during rotation of said sleeve (11) in order to fold, in two steps, the welded edges at said bottom. 20
3. Machine, according to claim 2, characterised in that said folding means include a curved member (45) situated at the side of said sleeve (11) opposite to said feeding means (40) for feeding articles and in an intermediate position of the path followed by said bottom of said envelope (3), with curve centre of the curved member (45) aligned with the rotation axis of said oscillating frame (7), and with a movable pad (46) situated in a position opposite to said feeding means (40) for feeding articles, and near to the bottom of said sleeve (11) in horizontal condition (H). 25 30 35
4. Machine, according to claim 1, characterised in that said feeding means (40) for feeding articles include a pusher (42), which takes over a number of articles or a bulk product (41) from a sliding surface (43) and moves along the sleeve (11) being in its horizontal condition (H), up to the bottom of said sleeve (11). 40
5. Machine, according to claim 1, characterised in that said feeding means (40) for feeding articles include a plate (44) moving horizontally and aimed at taking over a number of articles (41) from a sliding surface (43), and at moving them along the sleeve (11) being in its horizontal condition (H), up to the bottom of said sleeve (11), with one end of said plate (44) being raised so that inclination of said plate (44) causing a rubbing of said articles (41) against the wall of said sleeve (11), thus preventing said articles from going out of said sleeve (11) during said plate (44

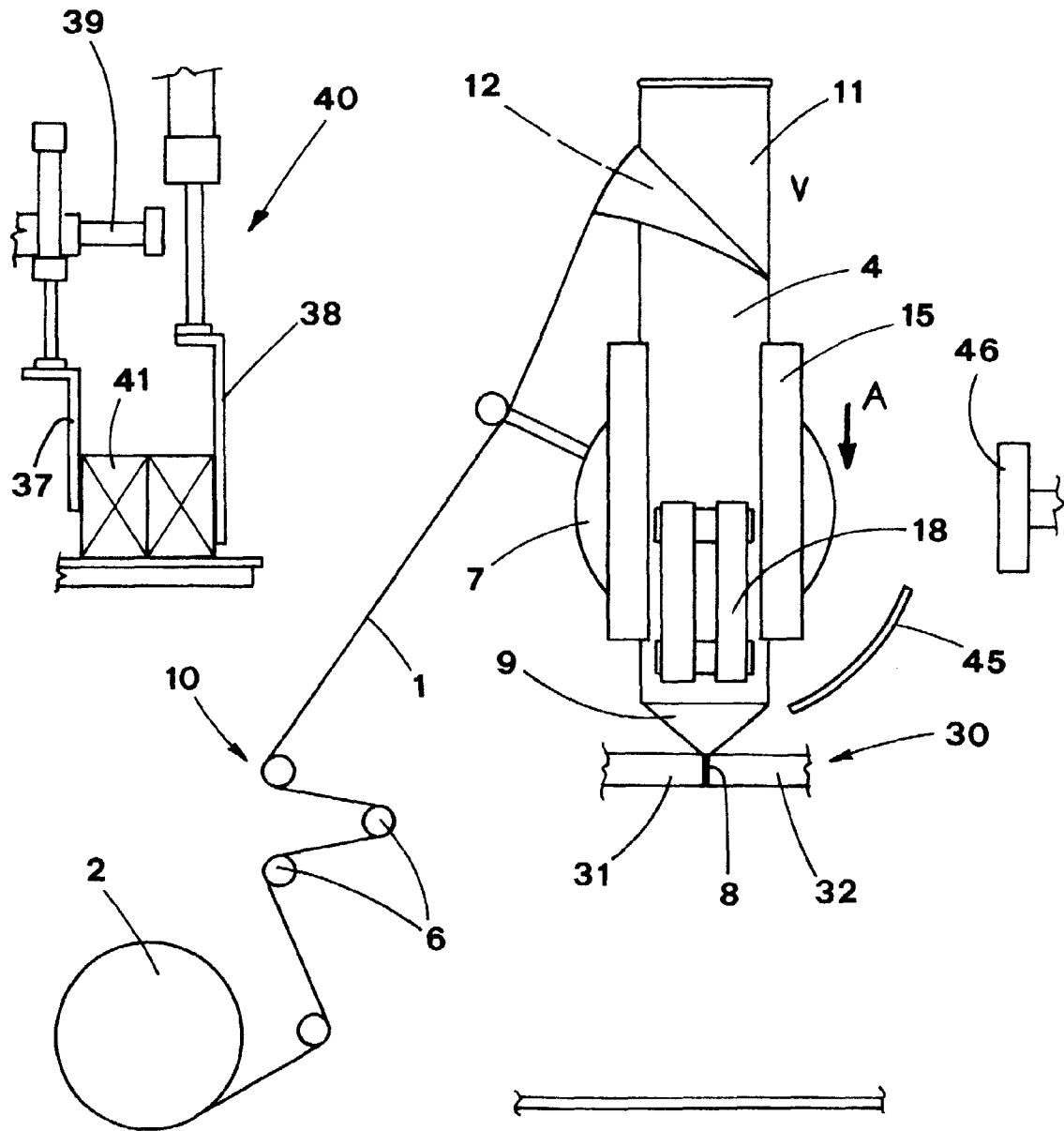
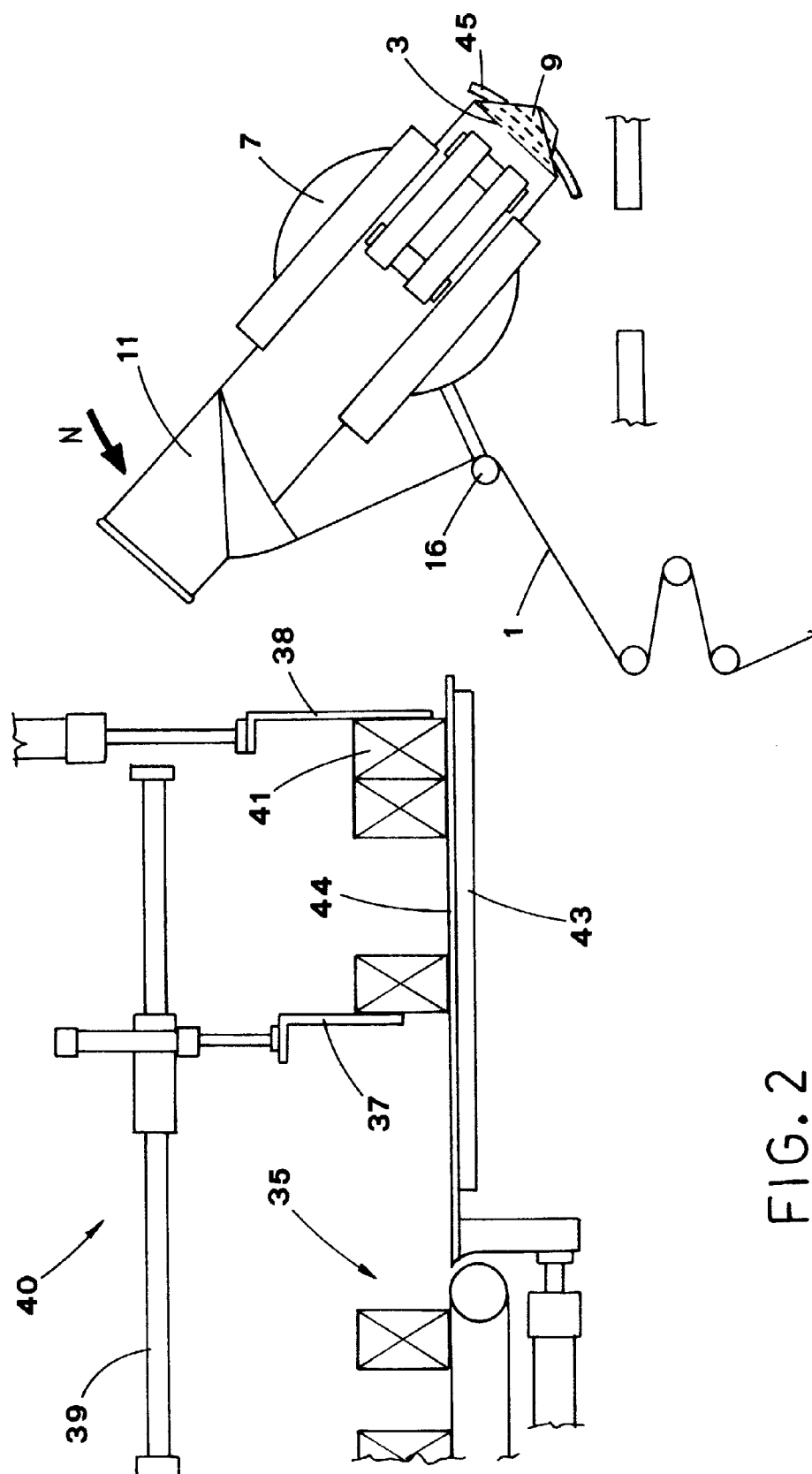


FIG. 1



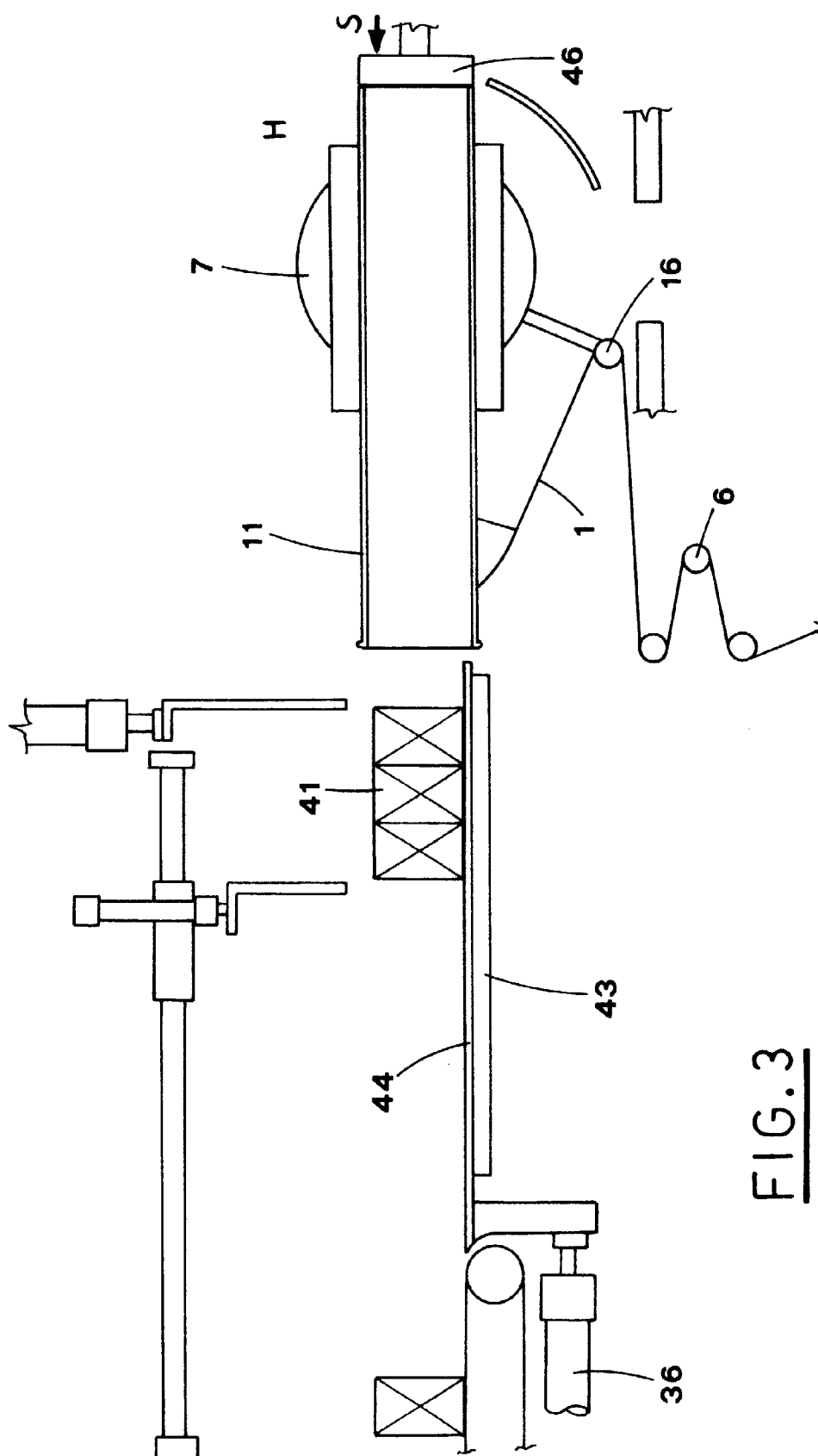


FIG. 4

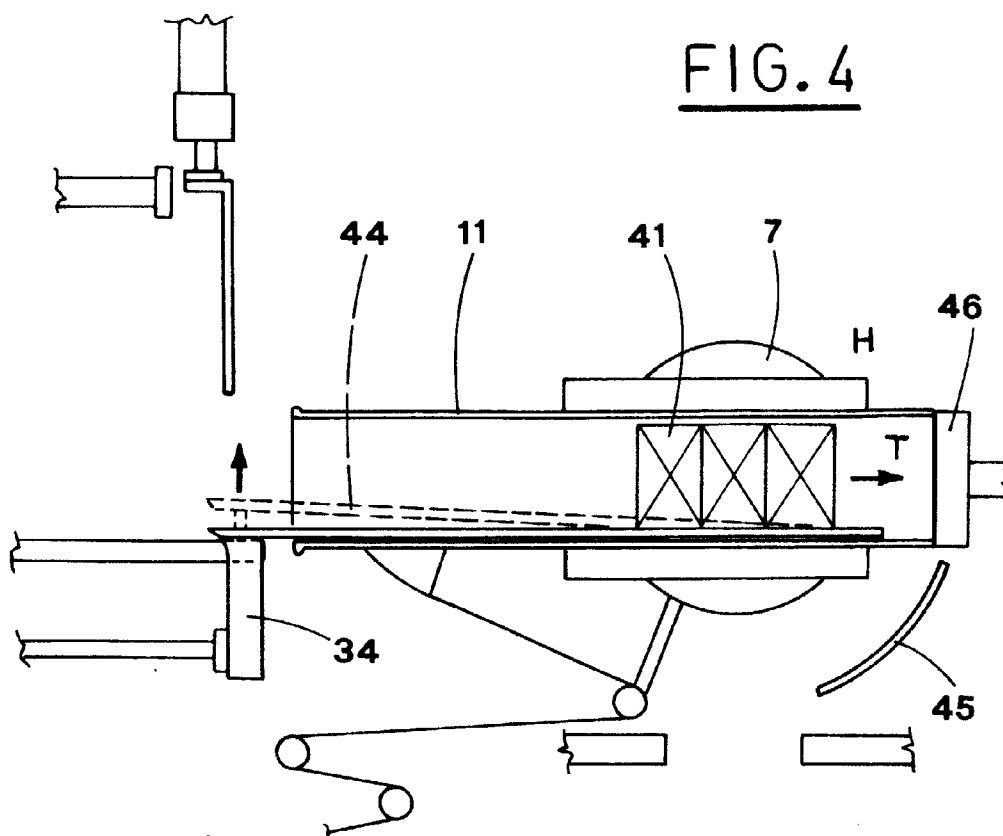
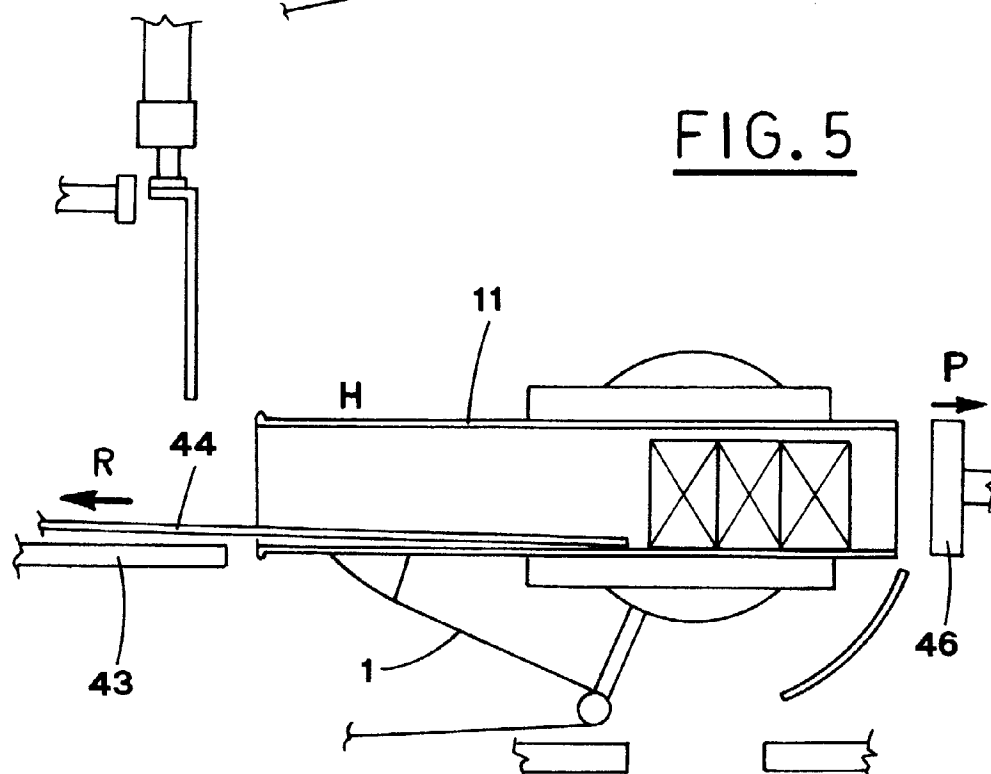
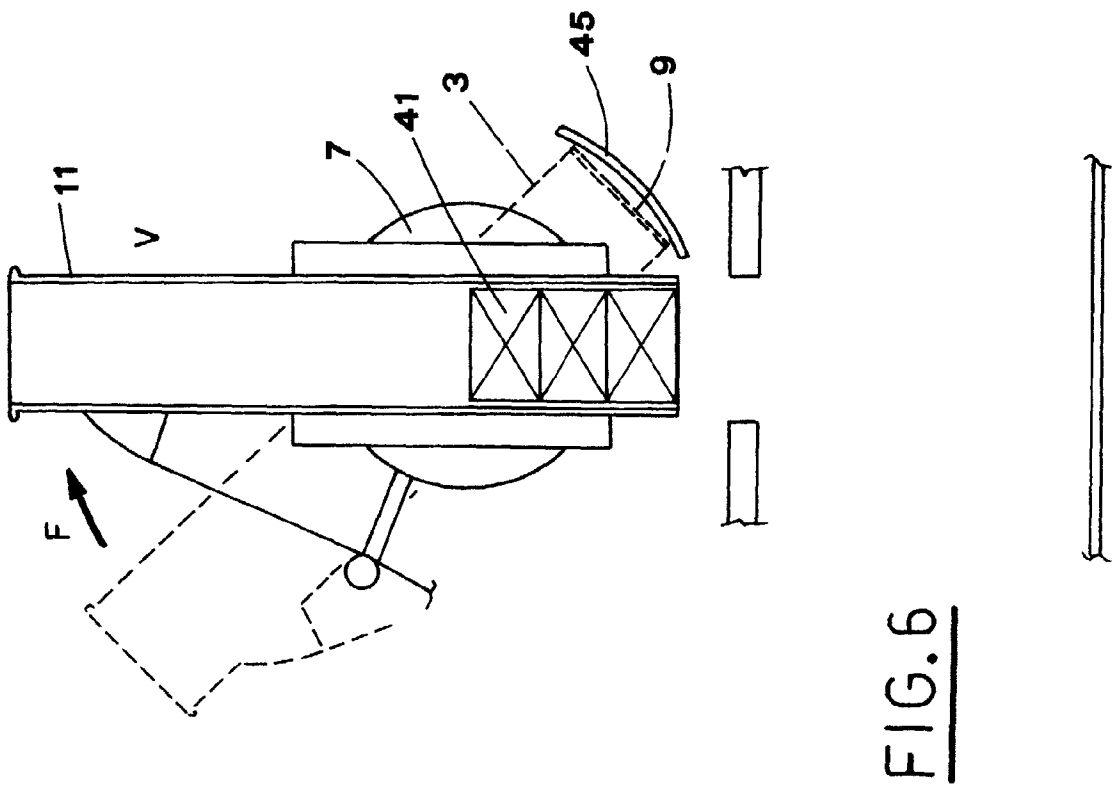
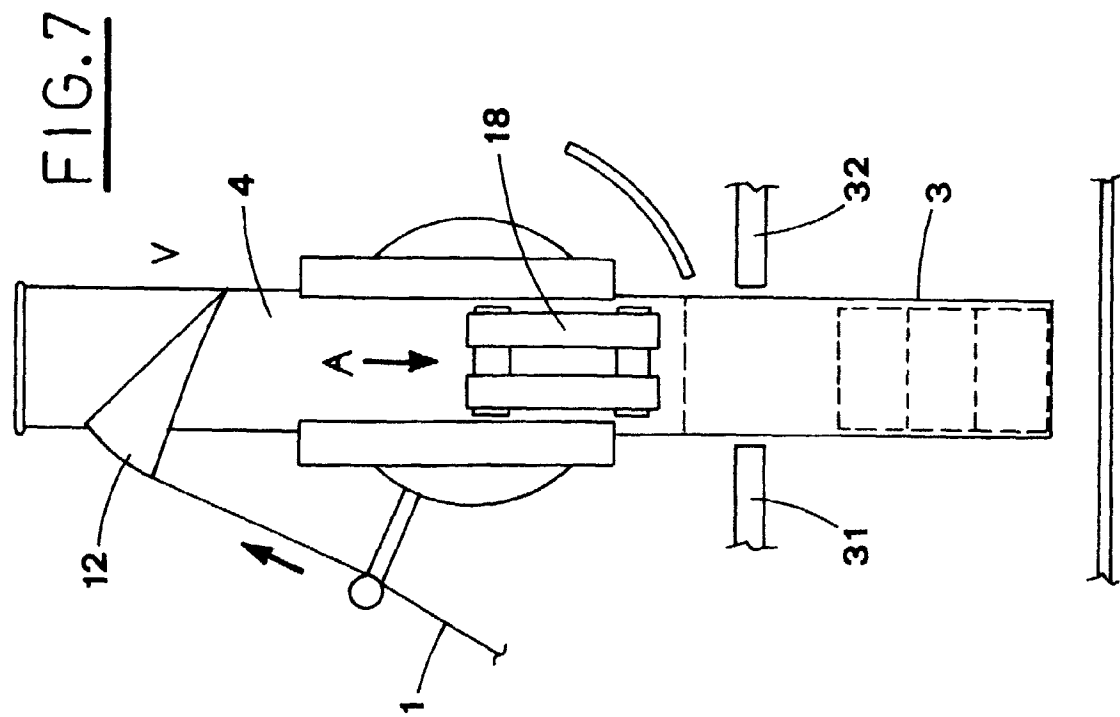


FIG. 5





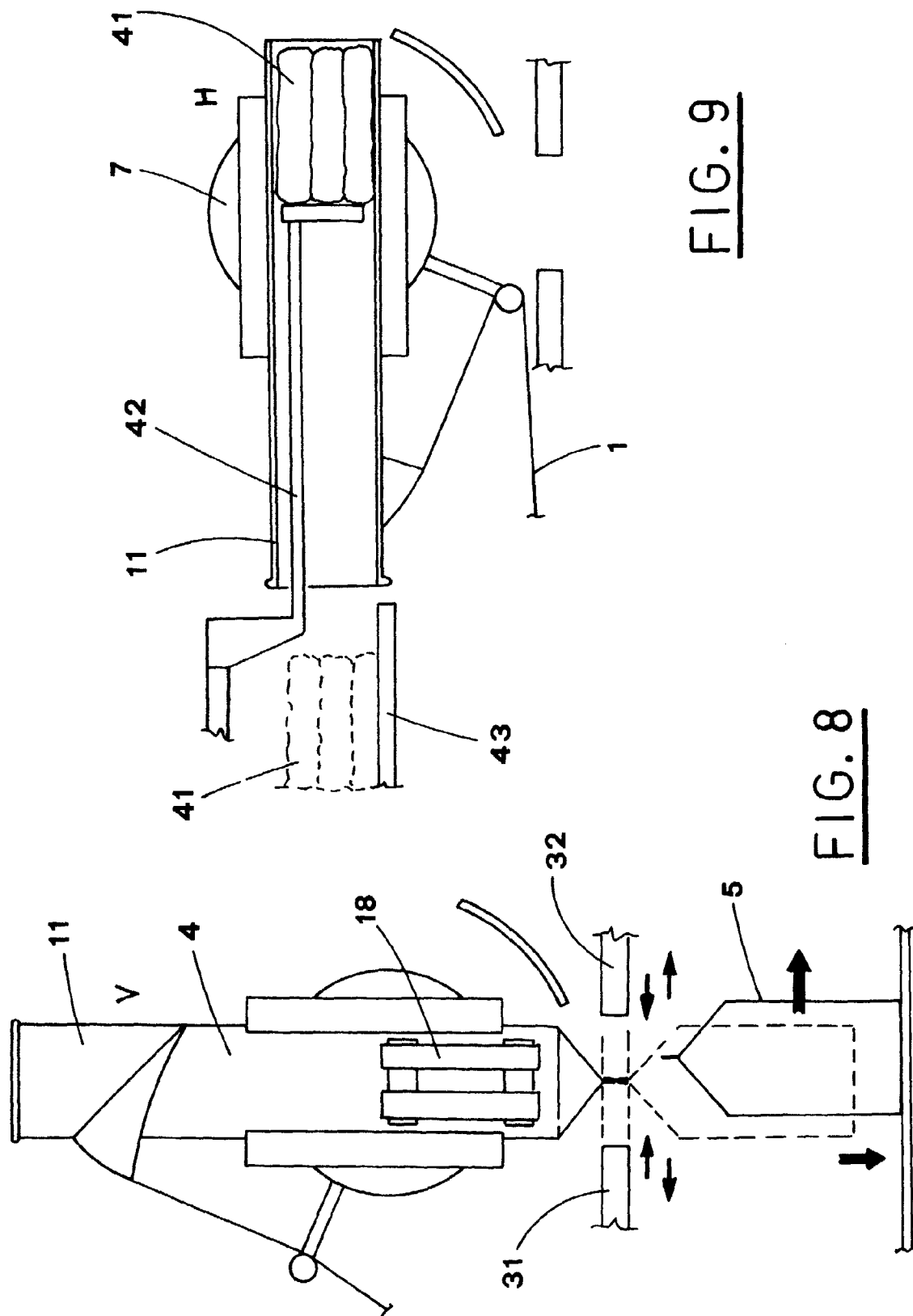


FIG. 9

FIG. 8



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EUROPEAN SEARCH REPORT

Application Number
EP 98 11 1024

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X Y	DE 19 29 956 U (HÖFLIGER & KARG) * page 2, line 15 - page 4, line 19; figures * ---	1,6,8 2,4,7	B65B9/20
Y	EP 0 573 811 A (ROVEMA) 15 December 1993 * column 7, line 21 - column 8, line 50; figures * ---	2	
Y	DE 19 15 044 U (H. MÜLLER) * page 4, line 15 - page 5, line 11; figures * ---	4	
Y	FR 2 600 052 A (FUJI MACHINERY) 18 December 1987 * page 10, line 8 - line 34; figure 1 * -----	7	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65B
The present search report has been drawn up for all claims			