



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.06.1998 Bulletin 1998/23

(51) Int Cl. 6: **B65B 65/02, B65B 59/00**

(21) Application number: **97309312.3**

(22) Date of filing: **19.11.1997**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Jänen, Johannes**
53840 Troisdorf (DE)

(74) Representative: **Marles, Alan David**
Stevens, Hewlett & Perkins
1 St Augustine's Place
Bristol BS1 4UD (GB)

(30) Priority: **28.11.1996 GB 9624737**

(71) Applicant: **RIVERWOOD INTERNATIONAL
CORPORATION**
Atlanta, Georgia 30339 (US)

(54) **Drive system for a packaging machine**

(57) There is provided a drive system 11 for a packaging machine for applying cartons to a plurality of articles. The drive system includes first and second drive motors 12, 13 and associated main shafts 14, 15, the second drive motor 13 taking a speed reference from

the first drive motor 12. The first main shaft 14 has a number of power take-offs 16 for driving the product pitched functions of the packaging machine. The second main shaft 15 also has a number of power take-offs 17 for driving the non-pitched functions of the packaging machine.

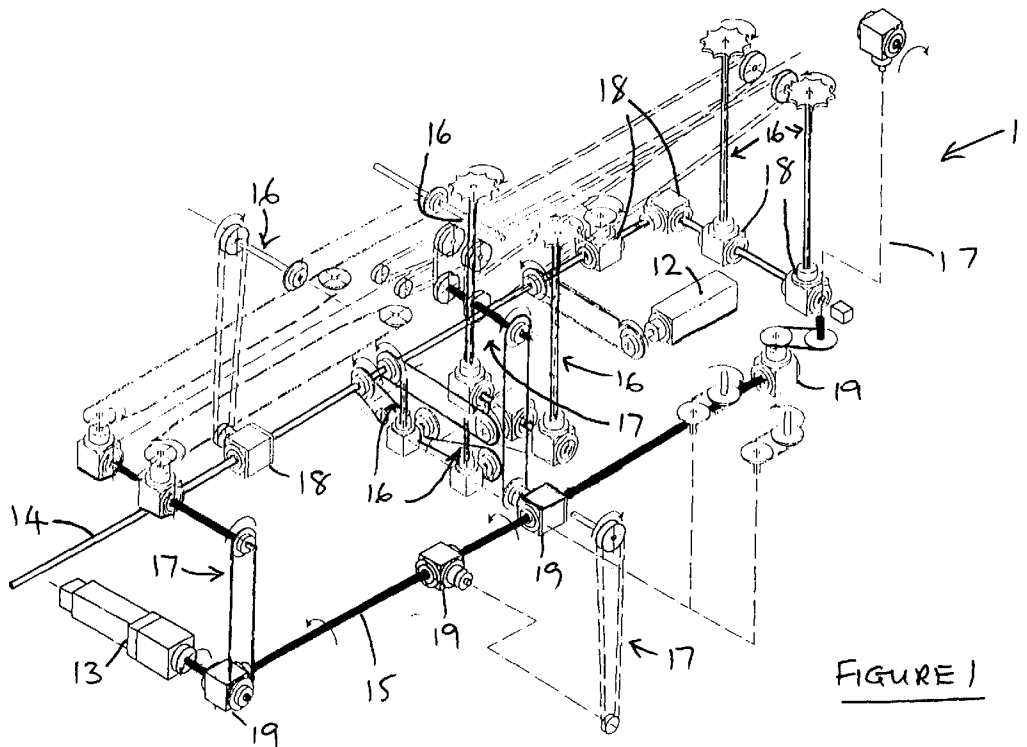


FIGURE 1

Description

The present invention relates to a drive system for a packaging machine.

In a packaging machine for applying cartons to a plurality of articles, such as a paperboard sleeve to a plurality of bottles, there are a number of functional parts which need to be driven at precise speeds and with precise synchronisation. If these are not achieved then the machine will not run smoothly or efficiently. The matter is complicated by the need to change the multipacks produced, for example, from 2 X 2 packs to 2 X 4 packs. The same number of cans may pass through the machine but half the number of carton blanks will need to be "picked" from the carton magazine. Certain parts of the machine will, therefore, need to be run at different speeds to other parts.

According to the present invention there is provided a drive system for a packaging machine for applying cartons to a plurality of articles, the drive system comprising first and second drive motors, the second motor taking a speed reference from the first motor, first and second main shafts for respective drive motors, a number of first power take-offs from the first main shaft and a number of second power take-offs from the second main shaft, the first power take-offs being connected to product pitched functions of the packaging machine and the second power take-offs being connected to non-pitched functions of the packaging machine.

Preferably the product pitched functions may include infeed starwheels, a carton pick mechanism, a folding mechanism for the carton sides, flap wheels for initiating a locking arrangement on the cartons. Also the non-pitched functions may include a transport conveyor for the articles, a carton transport mechanism, an overhead boom for engaging an upper portion of the carton being applied. An unpitched tightening mechanism for tightening the carton around the articles may also be a non-pitched machine function but could also be pitched.

In alternative embodiments there may be further servo drive motors associated with further main shafts and take-offs, which further drive motors take speed references from the first or second motors.

An embodiment of the present invention will now be described in more detail. The description makes reference to the accompanying drawings in which:

Figure 1 is a skeleton perspective view from one side of a drive system according to the present invention,

Figure 2 is a simplified view from the other side of a machine incorporating the drive arrangement of figure 1, and

Figure 3 is a simplified plan view of the machine shown in figure 2.

In the figures there is shown a packaging machine 10 which in this embodiment is designed for applying

and securing a sleeve type paperboard wrap around a plurality of articles such as bottles or cans. Other articles could be wrapped and the type of carton being applied could be different.

5 The packaging machine 10 incorporates a drive system 11 which comprises first and second drive motors 12, 13 connected to respective first and second main shafts 14, 15. The second drive 13 takes a speed reference from the first drive 12. Coupled to the first and second main shafts 14, 15 to be driven thereby are first and second sets of power take-offs 16, 17, said couplings generally including respective gearboxes 18, 19. (In this particular embodiment most gearbox ratios are 1:1). The power take-offs 16, 17 are used to drive the various working sections of the packaging machine 10 using a combination of shafts, belts, pulleys, further gearboxes and other suitable components. In figure 1, the second drive shaft and take-offs are shown blacked in.

20 A number of said working sections perform pitched functions which depend on the particular product/package configuration being run on the machine 10 at any one time and on the speed required in packs per minute. These first working sections will all be driven by the first power take-offs 16 and the settings for these first working sections will be stored for each package/speed combination in a computer management system.

25 The first working sections of the illustrated machine 10 include infeed starwheels 20 which meter the incoming product, a second set of starwheels 21, a carton pick mechanism 22 which takes a carton from a magazine 23 for each group of products to be wrapped, a folding mechanism in the form of rotating arms 24 for folding down the sides of each carton and also a flap folding section 25 which activates flap formations which constitute seat areas for heel portions of the products.

30 In contrast, a number of said working sections perform non-pitched functions which run at the specific linear speed of the machine 10 which is the product of the package length and the machine speed in packs per minute. For each specific product/package configuration combination and number of packs per minute permutation stored in the computer management system there is a corresponding speed reference given to the second drive 13 such that all of the second working sections driven by the second drive 13 run at the correct speed as of course do all of the first working sections driven by the first drive 12.

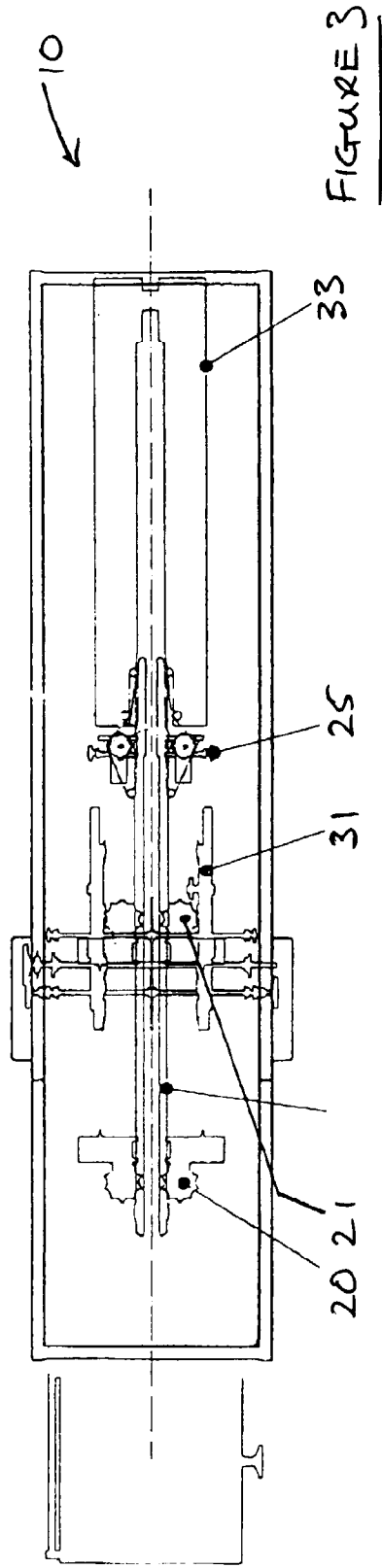
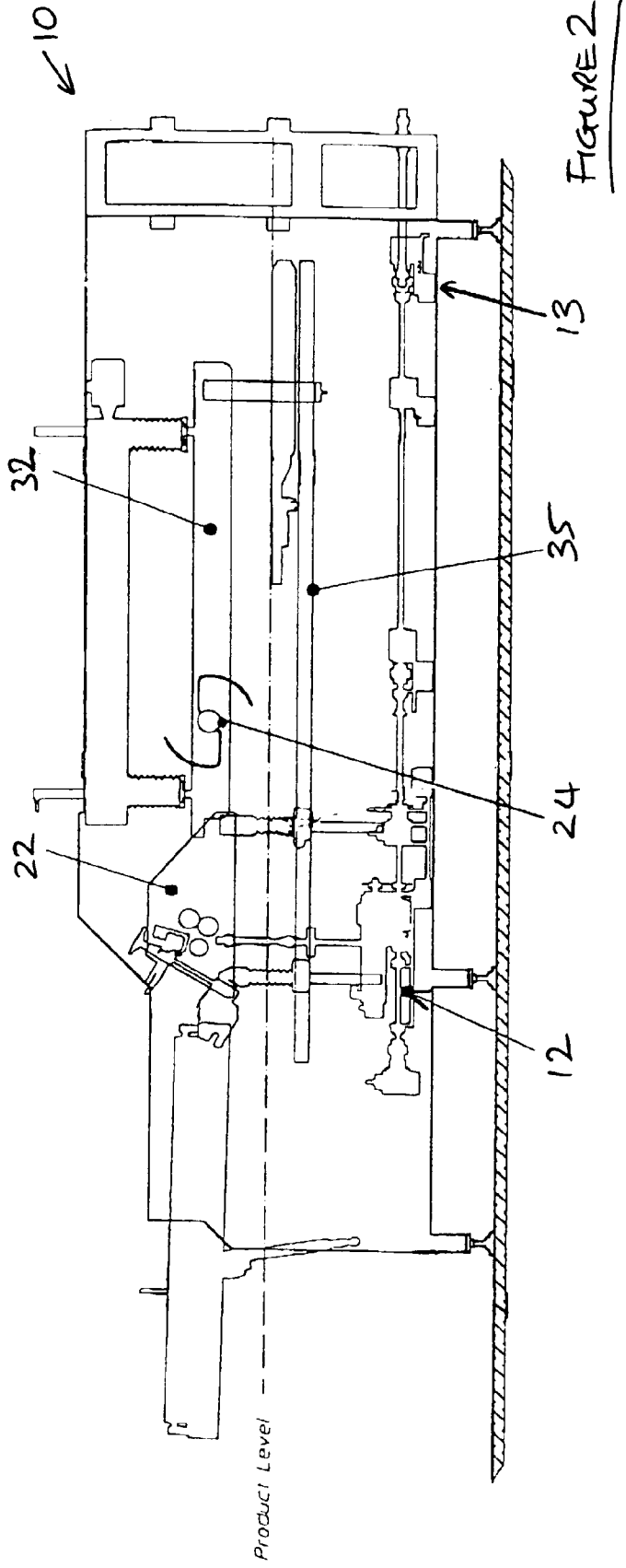
35 The second working sections of the illustrated machine 10 include a product transport conveyor 30 for moving the products through the machine over base plate 35, a carton transport mechanism 31 for moving the carton through at least a portion of the machine, an overhead boom section 32 which in this arrangement holds the carton against the products as they move through part of the machine 10 and a tightening/locking section 33 which tightens the carton around the products and activates interengaging locking formations on

the carton. Sometimes this tightening/locking section 33 could in fact be product pitched depending on its actual construction.

It will of course be appreciated that other functions could run off either the first or second drive shafts 14, 15 and some of those specified above may not be required in certain machine configurations. Also further drives and associated power take-offs could be provided, each taking a speed reference from the first or second drives. 5 10

Claims

1. A drive system for a packaging machine for applying cartons to a plurality of articles, the drive system comprising first and second drive motors, the second motor taking a speed reference from the first motor, first and second main shafts for respective drive motors, a number of first power take-offs from the first main shaft and a number of second power take-offs from the second main shaft, the first power take-offs being connected to product pitched functions of the packaging machine and the second power take-offs being connected to non-pitched functions of the packaging machine. 15 20 25
2. A drive system as claimed in claim 1 wherein the product pitched functions include infeed star-wheels, a carton pick mechanism, a folding mechanism for the carton sides, flap wheels for initiating a locking arrangement on the cartons. 30
3. A drive system as claimed in claim 1 or claim 2 wherein the non-pitched functions include a transport conveyor for the articles, a carton transport mechanism, an overhead boom for engaging an upper portion of the carton being applied. 35
4. A drive system as claimed in any one of claims 1 to 3 wherein a power take off is provided for a tightening mechanism for tightening the carton around the articles. 40
5. A drive system as claimed in any one of claims 1 to 4 wherein further servo drive motors associated with further main shafts and take-offs are provided, which further drive motors take speed references from the first or second motors. 45 50
6. A drive system as claimed in any one of claims 1 to 5 wherein gearboxes are associated with at least some of the power take-offs. 55





European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 30 9312

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)
A	GB 797 148 A (ATLANTA PAPER CO.) 25 June 1958 * page 2, line 123 - page 3, line 90; figure 3 *	1-3	B65B65/02 B65B59/00
A	FR 2 608 999 A (I.M.A.) 1 July 1988 * page 9, line 31 - page 10, line 25; figure 4 *	1	
A	DE 86 18 502 U (SITMA) 14 August 1986 * page 6, paragraph 1; figure 1 *	6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B65B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		12 February 1998	Grentzius, W
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPC FORM 1503 03.82 (P04C01)