



PACKAGING MACHINE WHICH CAN BE SET TO DIFFERENT PRODUCT WIDTHS

DE-A 40 02 02 484 discloses a machine for packaging books of different thicknesses. A guide plate can be adjusted in parallel by two synchronized spindles. A third, likewise synchronized spindle with half pitch adjusts a further element by half the amount in each case. The journals of the three spindles are located in a common plane.

The object of the present invention is to design a packaging machine having a through-path for products, a wrapping-material feed, folding means, sealing means and transporting means, such that this machine can easily be set, transversely with respect to the transporting direction, for different product widths. This object is achieved by the combination of features in the claims. An exemplary embodiment of the invention is explained hereinbelow with reference to the drawings, in which: Figure 1 shows a schematic side view, Figure 2 shows a plan view, partly in section, and Figure 3 shows a section along line III-III in Figure 2.

The apparatus 1 serves for packaging groups 2 of foodstuff discs, e.g. biscuits, which are located on edge and rest flatly against one another. The groups 2 are fed, in the conveying direction A, cyclically and at regular intervals to the apparatus 1 on a first conveyor 3. At the inlet end of the apparatus 1, the group 2 is enveloped by a wrapping-material film 4. The film 4 is drawn off cyclically, transversely with respect to the transporting direction A, from a supply roll 5 and a cutter 6 cuts off an appropriate length of this film. The centre of the piece of film which has been cut off is located in the centre plane M. As the next group 2 is transported further, it is enveloped by the piece of film 7 and a sealing seam is formed by two transverse-sealing jaws 8. The enveloped groups 2 are then moved on cyclically through the apparatus 1 by a comb-like conveyor. In this case, they pass first of all into an

end-side folding device 10, one of which is arranged on either side. Each device 10 comprises two mutually overlapping, triangular metal plates 11 which are offset in relation to one another transversely with respect to the transporting direction and are arranged symmetrically with respect to one another and with respect to the centre plane M. The metal plates 11 form, on the end sides of the groups 2, sealing seams which are folded flatly onto these end sides. As the groups 2 are transported further, they pass into a sealing device 12. The latter comprises, on either side, a number of sealing jaws 13 which can be moved transversely with respect to the transporting direction A, are moved with respect to one another by the lifting element 14 and seal the end-side sealing seams. After the sealing operation, the packs 15 are pushed onto a further conveyor 16, which transports them away.

The folding means 10 and the sealing device 12 on each side are mounted on a carrier plate 20 in each case. For the sake of clarity, these elements, together with the transporting means 9, have been omitted from Figure 2. The plates 20 are guided displaceably on three circular-cylindrical tubes 21. For tolerance reasons, it may be expedient to design one of the bores 22 of the plates 20 as a cylindrical sliding-fit bore, a second of the bores as a slot with sliding fit in the vertical direction, and the third bore as a bore 22 of larger diameter. The tubes 21 have, on either side, a shoulder 23 and a thread 24, which is inserted through a plate 25, 26 in each case. The tubes 21 are fastened on the plates 25, 26 by means of nuts 27. The plates 25, 26 can be adjusted in height by synchronously driven threaded spindles 28, in order to adapt the apparatus 1 to different diameters or shapes of the discs in the groups 2. In each case one radial bearing 32 is pushed into the two tube ends and secured axially in the tube 21 by screws 33. A threaded spindle 34 with a right-hand thread 35 and a left-hand thread 36 is mounted rotatably in the bearings 32. The threads 35, 36 have the same lead. On

one side, a chain wheel 37 is fastened on the spindle 34. The three chain wheels 37 are connected to one another via a chain 38. The spindle 34 is secured against axial displacement by the chain wheel 37 and a securing disc 39.

In each case one nut 42 is screwed onto the threads 35, 36. Each nut 42 is secured against rotation by a pin 43. The pin 43 sits loosely in a transverse bore 44 of the nut 42 and engages through a longitudinal slit 45 in the tube 21. The pin 43 is inserted in a bore 46 of a plate 47. The plate 47 is fastened on the relevant carrying plate 20 by means of screws 48. One of the screws 48 simultaneously secures the pin 43. The sectional illustration of the left-hand tube 21 is depicted in a state in which it has been turned through 90°. In reality, all the slits 45 are vertically beneath the spindles 34. This effectively prevents soiling of the spindles 34. This is important, in particular, in the packaging of biscuits. One of the spindles 34 also has a handwheel or a crank 49. As can be seen from Figure 1, the connecting lines 50 which connect the journals 21 [sic] of the spindles 34 form a polygon in side view, this polygon being a triangle in the exemplary embodiment illustrated. The three-point mounting secures the plates 20 against tilting as a result of transverse forces which occur during sealing of the sealing seams, the plates being thus secured even in the case of unequal loading. The adjustment apparatus described requires only a small number of straightforward and usually identical parts. The machine can be adapted very easily to different lengths of the groups 2.

Rather than being guided displaceably on the tubes 21, it is also possible for the carrying plates 20 to be guided displaceably on two separate transverse rods which are fastened in the plates 25, 26. In this case, all the bores 22 have a larger diameter than the tubes 21.

Patent claims

1. Packaging machine having a through-path for products (2), a wrapping-material feed (4-6), folding means (10), sealing means (20) and transporting means (9), comprising two carrying plates (20) which can each be adjusted parallel to one another, and in opposite directions, by means of at least three spindles (34) which have threads (35, 36), the connecting lines (50) between the spindle journals (51) forming a polygon as seen in the direction of the journals (51) of the spindles (34), and means (38, 49) being provided for driving the spindles (34) synchronously.
2. Machine according to Claim 1, each spindle (34), in the region of its ends, being mounted in a radial bearing (32) in each case and being retained in an axially non-displaceable manner, and nuts (42) which are screwed onto the threads (35, 36) and have connecting parts (43, 47) for connection to the carrying plates (20) being arranged between the bearings (32).
3. Machine according to Claim 2, the radial bearings (32) of each spindle (34) being arranged in each case in one support (21), which is fastened on a framework (25, 26).
4. Machine according to Claim 3, the support being designed as a tube (21) which encloses the relevant spindle (34) and has a longitudinal slit (45) by way of which the nuts (42) are connected to the carrying plates (20) via the connecting parts (43, 47), and the longitudinal slit (45) preferably being arranged on the underside of the tube (21).
5. Machine according to Claim 3 or 4, the carrying plates (20) having openings (22) through which the supports (21) are inserted.
6. Apparatus [sic] according to one of Claims 3 to 5, the carrying plates (20) being guided displaceably on at least two of the supports (21).
7. Machine according to one of Claims 3 to 6, the supports (21) being fastened, on both sides, on a



framework mounted panel (25) in each case.

8. Machine according to one of Claims 1 to 7, the
spindles (34) being connected to one another by non-slip
means of forced rotation (38), in particular by a chain,
5 a toothed belt or gear wheels.
9. Machine according to Claim 8, one of the spindles
(34) having a handwheel or a crank (49).
10. Machine according to one of Claims 1 to 9, the
carrying plates (20) bearing the folding devices (11) and
10 sealing jaws (13).
11. Machine according to one of Claims 1 to 10, each
spindle (34) having a right-hand thread (35) and a left-
hand thread (36).



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