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(54) **CLOSING DEVICE AND WRAPPING MACHINE COMPRISING THE CLOSING DEVICE**

(57) A closing device (1) is configured for a wrapping machine of the type comprising a turntable or a ring and suitable for closing an open end (2) of a wrapping (3) of thermoweldable extendible plastic film when said plastic film is wrapped around a palletised product (4) by said wrapping machine, said open end (2) being provided in a band (3A) of said wrapping (3) that projects beyond the top (5) of said palletised product (4), said closing device (1) comprising closing means (7) arranged for bringing together portions of said band (3A) and retaining means (6) cooperating with said closing means (7) and arranged for retaining said plastic film of said open end (2) and for folding said portions, said closing means (7) being provided with a welding element (8) for welding said portions of said band (3A) above said top (5), so as to close the

opening of said open end (2), in which said closing means (7) comprises a pair of arms (7A, 7B), supported by a framework (9) provided in said closing device (1) and drivable in such a manner that at least respective ends (12) of said arms (7A, 7B) are movable towards and away from one another, said welding element (8) being fixed to each of said respective ends (12), and in which said retaining means (6) is connected to said closing means (7) in such a manner as to be driven by the motion of said closing means (7) between an extended configuration (E), in which said retaining means (6) maintains said portions extended and a folded configuration (K), in which retaining means (6) retains said portions substantially superimposed on one another (H).

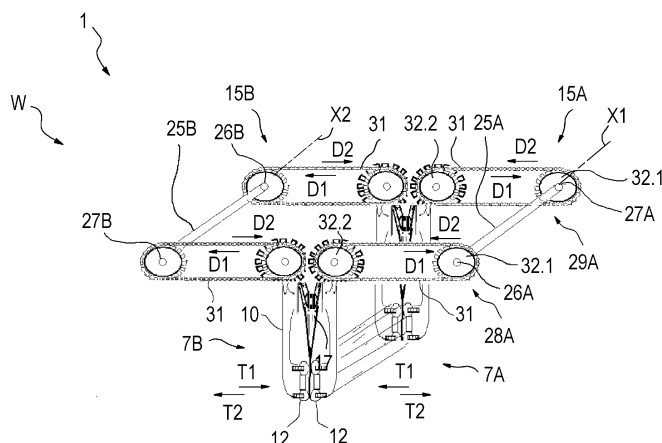


Fig.3



EUROPEAN SEARCH REPORT

Application Number
EP 17 15 5755

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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A	WO 95/14614 A1 (VESME SYSTEMS OY [FI]; RAUHALA JUHANI [FI]; AIROLA HEIKKI [FI]) 1 June 1995 (1995-06-01) * figures 1-6 *	1-5,10	TECHNICAL FIELDS SEARCHED (IPC) B65B
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The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 8 May 2017	Examiner Paetzke, Uwe
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			

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-5, 10

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).



LACK OF UNITY OF INVENTION **SHEET B**

Application Number

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-5, 10

A first group of invention comprises claims 1 to 5 and 10. The underlying first invention is in addition to the features of claim 1 further defined by the potentially corresponding special technical features contained in claims 2 to 5, namely by features that are related to the mechanical design of the closing means with the welding device.

These features have the technical effect according to which the welding element can be moved from a position outside the wrapping area to a sealing position and to the mechanical coupling of the retaining means to the movement of the welding element.

Accordingly, the first invention is directed to solving the problem of providing a suitable mechanical design of a closing device that enables wrapping and sealing the top cover.

2. claims: 6-9

A second group of invention comprises claims 6 to 9. The underlying second invention is in addition to the features of claim 1 further defined by the potentially corresponding special technical features contained in the respective claims dependent on claim 1, i.e. by features that are related to the type of the retaining means (with sucking means and/or bounding elements/bars).

These features have the technical effect according to which the portion of the foil that protrudes above the product (band 3A) can be folded together in a gusseted manner and that the foil can be held firmly during the wrapping and folding.

Accordingly, the second invention is directed to solving the problem of improving the reliability and the folding result of a foil covering a top of a product.

3. claims: 11, 12

A third group of invention comprises claims 11 to 12. The underlying third invention is further defined by the potentially corresponding special technical features contained in claim 11 according to which the wrapping device contains a pressing element.

This pressing element serves to stabilize palletized goods during the wrapping process.

The problem solved by this group of invention is therefore regarded as providing a solution of how to wrap a pile of loosely stacked products.



LACK OF UNITY OF INVENTION
SHEET B

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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82