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- (71) Applicant: **ORKEL HOLDING AS** [NO/NO];
Gilhaugvegen 13, 7320 Fannrem (NO).
- (72) Inventor: **HAGEN, Øyvind Jonassen**; Bratsbergveien
336, 7039 Trondheim (NO).
- (74) Agent: **LINCOLN IP**; 4 Rubislaw Place, Aberdeen AB10
IXN (GB).
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MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA,
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(54) Title: FOIL WRAPPING DEVICE

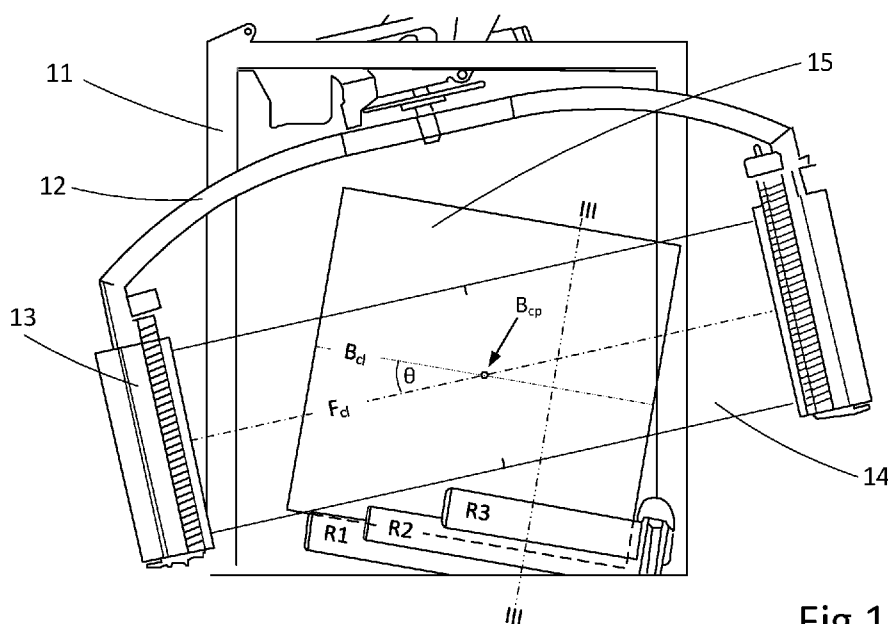


Fig 1

(57) Abstract: Foil wrapping device (10) for wrapping foil (14) around a cylindrical object (15) of a given size, comprising wrapping arms (12) and a wrapping table comprising pairs of powered support rollers (R1, R2, R3). The wrapping arms (12) are arranged to wrap layers of foil partly overlapping one another on the object by rotating one of the wrapping arms (12) and the wrapping table. The wrapping arms (12) are arranged such that a centre line (F_{cl}) of the foil (14) is stretched to the cylindrical object (15) at an angle (θ) in the region between 15 and 45 degrees with the length axes of the support rollers (R1, R2, R3). In one aspect, the centre line (F_{cl}) of the foil passes the centre point (B_{cp}) of the cylindrical object with a maximum deviation of less than 10 % of the diameter of the cylindrical object. In another aspect, the support rollers are arranged with a maximum relative length extension $R_e(N)$ as percentage of the length of the cylindrical object (15), as defined by the equation: $R_e(N) < 105 - 1.4 \phi_N$, where $R_e(N)$ is the extension of the support roller (N) in question as a

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percentage of the length of the cylindrical object (15), ϕ_N is the angular position of the support roller R(N) in degrees from a vertical line through the centre of the cylindrical object (15).

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2024/065672

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims;; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. B65B11/04 A01F15/07
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65B A01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal, WPI Data**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 7 067 833 B2 (LELY ENTPR AG A SWISS LTD LIAB [CH]) 27 June 2006 (2006-06-27)	1-16
Y	column 2, line 15 - column 3, line 15; figure 1	2,17-23, 30
A		24-29
Y	----- US 6 341 470 B1 (LACEY LIAM J [IE]) 29 January 2002 (2002-01-29)	2
A	column 11, line 16 - line 35; figures 15,16	1,3-16
A	----- DE 42 01 485 A1 (DEERE & CO [DE]) 22 July 1993 (1993-07-22) the whole document	1-16
	----- - / - -	



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"X" document of particular relevance;; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance;; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

16 December 2024

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Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2

NL - 2280 HV Rijswijk

Tel. (+31-70) 340-2040,

Fax: (+31-70) 340-3016

Authorized officer

Kelliher, Cormac

INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 042 225 A (DRURY DAVID J [GB] ET AL) 27 August 1991 (1991-08-27)	17-23,30
A	column 3, line 41 - column 4, line 65; figure 2 -----	24-29
Y	EP 1 050 207 A2 (AGRI PATENTS LIMITED [IE]) 8 November 2000 (2000-11-08)	17-23,30
A	paragraph [0017] - paragraph [0025]; figures 1-14 -----	24-29
Y	US 4 685 270 A (BRAMBILLA DARIO [IT]) 11 August 1987 (1987-08-11)	17-23,30
A	column 3, line 13 - line 47; figure 2 -----	24-29

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2024/065672

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		US 4685270 A 11-08-1987	

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-16

Concern a device for wrapping foil around a cylindrical object, where the foil is wrapped in a particular manner.

2. claims: 17-30

Concern a device for wrapping foil around a cylindrical object, where the support rollers have a particular length.
