



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.01.2019 Bulletin 2019/05

(51) Int Cl.:
B65B 53/06 (2006.01) **B65B 61/02** (2006.01)
B65B 61/22 (2006.01) **B65D 71/08** (2006.01)

(21) Application number: **18185457.1**

(22) Date of filing: **25.07.2018**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(71) Applicant: **Cerf, Alain**
Pinellas Park, FL 33782 (US)

(72) Inventor: **Cerf, Alain**
Pinellas Park, FL 33782 (US)

(74) Representative: **Jackson, Derek Charles**
Derek Jackson Associates
The Old Yard
Lower Town
Claines
Worcestershire WR3 7RY (GB)

(30) Priority: **26.07.2017 US 201715660507**

(54) **COOLING HOLES FOR FILM WRAPPED ARTICLES**

(57) Holes in the film can be formed after film wrapping the bundle. Slits are formed in the heat shrink film prior to film wrapping the bundle. While the bundle moves through a heat shrink tunnel on a conveyor, the slits can be opened by increasing the shrinkage of the film sur-

rounding the slit. This can be accomplished by directing high speed jets of hot air on the slits. Although slits are preferred the hot air can be used on any opening to increase the size of the opening.

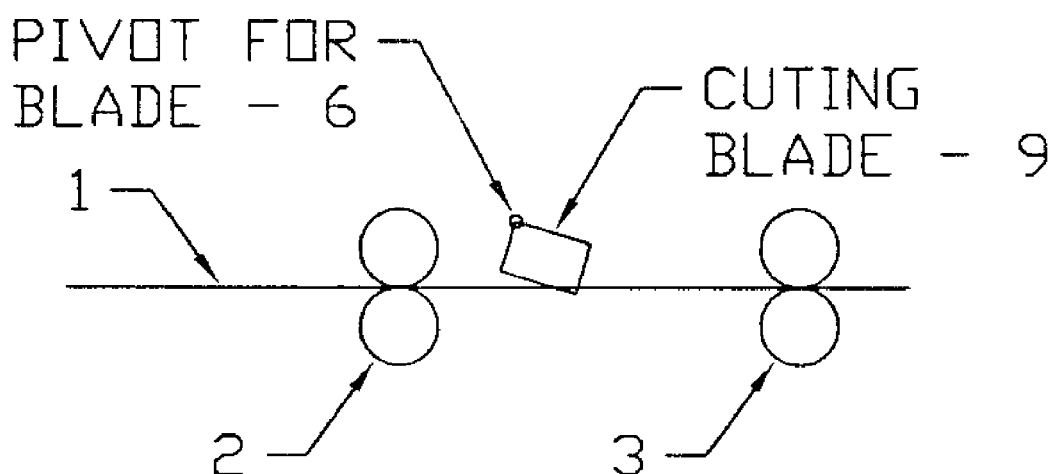


Fig. 1

Description**Claims****Background Art**

[0001] This invention relates to cooling or freezing an article or a bundle of articles after the article has been filmed wrapped and heat shrunk. The term article refers to a bundle of articles such as bottles or a single article. These articles are perishable and require a cooled environment.

[0002] The prior art has placed articles in cartons, having holes in the carton, to allow cold air to circulate in the carton during the freezing or cooling of the articles. This technique of cutting holes in the heat shrink film for air circulation of the article has been tried without success. Cutting the holes mechanically with an heated die or heat while the heat shrink material is moving resulted in hole sizes of less than about 3/8 inch. The prior art was in need of a commercial viable way of creating openings large enough to allow sufficient air circulation to cool or freeze articles wrapped with a heat shrunk film.

[0003] The prior art, shown in US Patent Application number 13/972,078 filed on August 21, 2013 by Alain Cerf titled, Cooling film Wrapped Articles, is incorporated by reference in the entirety. The application shows forming slits or slots in the longitudinal direction in a heat shrink film for allowing cooling air to circulate between the articles while maintaining the structural integrity of the heat shrunk film. This invention was not always able to achieve openings of sufficient size for allowing cooling air to circulate between the articles

Description of embodiments

[0004] Figure 1 shows a film 1 moving between a set of rollers 2 and 3. Adjustable blade 7 on pivot 6 is lowered to cut a slit in the film. The location and the length of the slit is formed so that when a bundle of articles are film wrapped the slit 4 is located on the vertical sides of the bundle.

[0005] Figure 2 shows three vertical slits 4 and three vertical slits 5 to be

[0006] located on opposing vertical sides of the bundle. After film wrapping the bundle moves through a heat shrink tunnel on a conveyor where the film is heat shrunk. Within in the tunnel, the slits are opened by increasing the shrinkage of the film surrounding the slit. This can be accomplished by directing high speed jets of hot air on the slits. Openings in excess of 20-25 mm can be achieved.

[0007] Figure 3 shows cups of yogurt 7 having opened slits using jets of hot air.

[0008] After the film is heat shrunk, the wrapped article is transported to a freezer or cooler 7 to prevent spoilage of the contents within the bundle. The heat shrunk bundle can be bundled or palletized prior to entering the freezer or cooler.

1. A process for arranging an article or a bundle of articles wrapped with heat shrink film so that cool air can circulate through the bundle comprising, forming an opening in the film, film wrapping the bundle, transporting the wrapped bundle to a heat shrink tunnel, heat shrinking the bundle, and increasing the size of the opening during heat shrinking by increasing the heat shrinkage of the film surrounding the opening.
2. A process according to claim 1 wherein the opening is a slit.
3. A process according to claim 1 wherein the heat shrinkage of the film is increased by directing high speed jets of hot air on the film surrounding the opening during heat shrinking of the film.
4. A process for arranging an article or a bundle of articles wrapped with heat shrink film so that cool air can circulate through the bundle comprising, forming a slit in the film, locating the slit so the slit is positioned on the vertical sides of the bundle during film wrapping, film wrapping the bundle, transporting the wrapped bundle to a heat shrink tunnel, heat shrinking the bundle, and increasing the opening of the slit during heat shrinking by increasing the heat shrinkage of the film surrounding the slit.
5. A process according to claim 4 including cooling the film wrapped article to prevent spoilage.
6. A process according to claim 4 including multiple vertical slits located on opposing vertical sides of the bundle.
7. A process according to claim 4 wherein high speed jets of hot air are directed on the slit during heat shrinking of the film.
8. An apparatus for arranging an article or a bundle of articles wrapped with heat shrink film so that cool air can circulate through the bundle comprising, means for forming a slit in the film, means for locating the slit so that the slit is positioned on the vertical sides of the bundle during film wrapping, means for film wrapping the bundle, means for transporting the wrapped bundle to a heat shrink tunnel, means for heat shrinking the bundle, and means for increasing the opening of the slit by increasing the heat shrinkage of the film surrounding the slit.
9. An apparatus according to claim 8 including means for cooling the film wrapped article to prevent spoilage.

10. An apparatus according to claim 8 including means for forming multiple vertical slits on opposing vertical sides of the bundle.

11. An apparatus according to claim 8 wherein means for directing high speed jets of hot air on the slits during heat shrinking of the film.

10

15

20

25

30

35

40

45

50

55

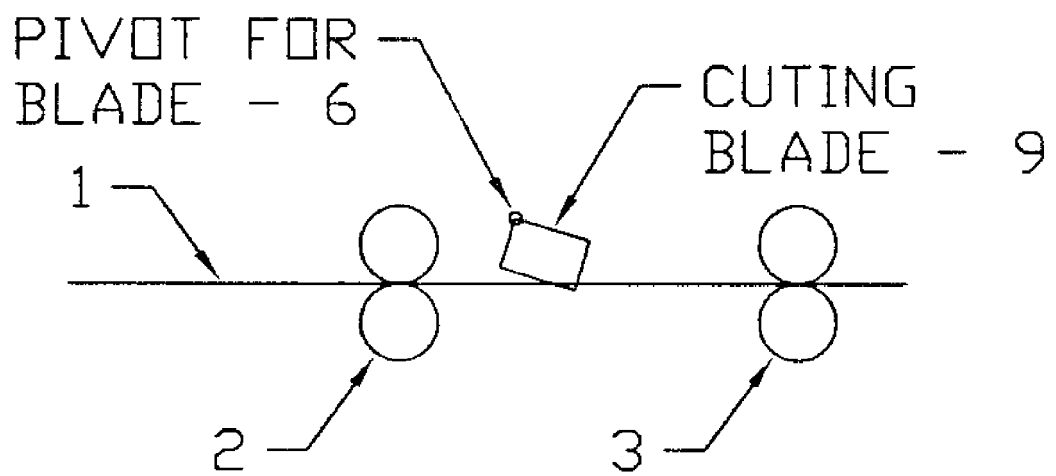


Fig. 1

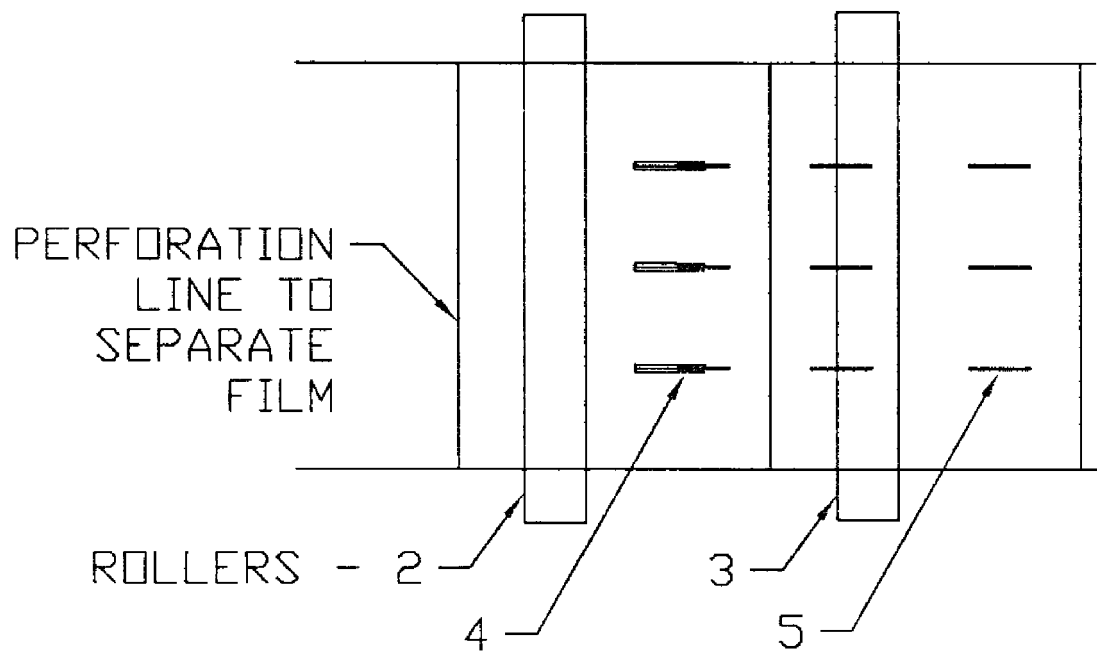


Fig. 2

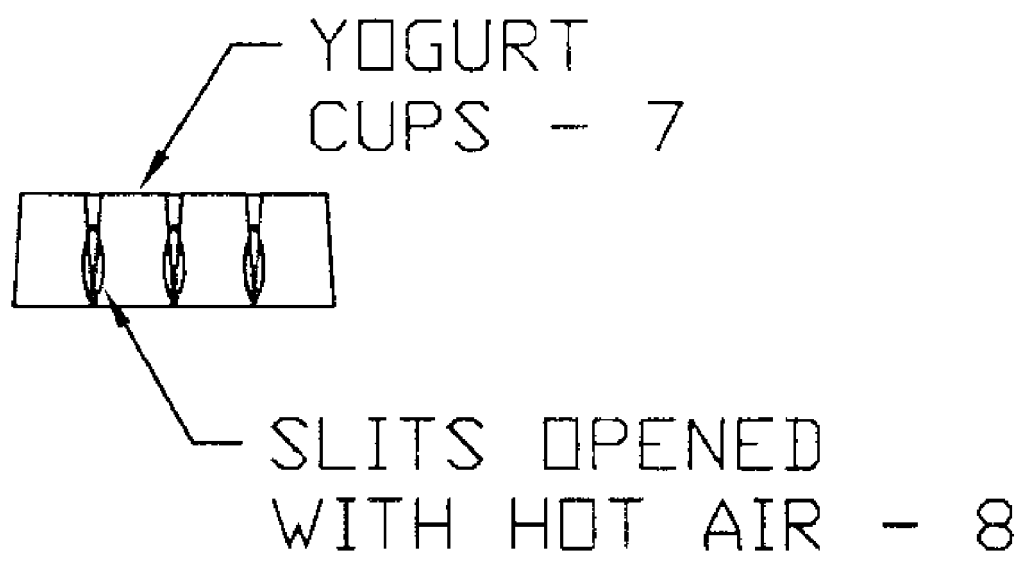


Fig. 3



EUROPEAN SEARCH REPORT

Application Number
EP 18 18 5457

5

10

15

20

25

30

35

40

45

50

55

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	EP 0 879 770 A1 (UNILEVER PLC [GB]; UNILEVER NV [NL]) 25 November 1998 (1998-11-25)	1	INV. B65B53/06 B65B61/02 B65B61/22 B65D71/08
Y	* abstract *	2,4-6,	
	* figure 1 *	8-10	
A	* column 7, line 57 - column 8, line 1 *	3,7,11	
	* column 4, line 50 *		
	* column 5, line 2 - line 9 *		

Y	US 6 820 745 B1 (ONO TADASHI [JP] ET AL) 23 November 2004 (2004-11-23)	2,4,6,8,10	
	* abstract *		
	* figure 12 *		
	* claim 1 *		

Y	WO 2015/026982 A1 (CERF ALAIN [US]) 26 February 2015 (2015-02-26)	5,9	
	* abstract *		
	* claim 1 *		

A	WO 02/36436 A1 (NEAGLE CLAUDE ANDREW [US]; MARTI JEAN [DE]) 10 May 2002 (2002-05-10)	1-11	TECHNICAL FIELDS SEARCHED (IPC) B65B B65D
	* abstract *		
	* claims 4-5 *		

The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 9 November 2018	Examiner Damiani, Alberto
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	

EPO FORM 1503 03.82 (P04C01)

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

EP 18 18 5457

5

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.

09-11-2018

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0879770	A1	25-11-1998	CA	2238136 A1	21-11-1998
			DE	69800632 D1	03-05-2001
			DE	69800632 T2	05-07-2001
			EP	0879770 A1	25-11-1998
			ES	2157638 T3	16-08-2001
			US	5992630 A	30-11-1999

US 6820745	B1	23-11-2004	CN	1358153 A	10-07-2002
			CN	1495107 A	12-05-2004
			CN	1495114 A	12-05-2004
			EP	1234779 A1	28-08-2002
			US	6820745 B1	23-11-2004
			US	2005050857 A1	10-03-2005
			WO	0132527 A1	10-05-2001

WO 2015026982	A1	26-02-2015	EP	3036165 A1	29-06-2016
			US	2015053698 A1	26-02-2015
			WO	2015026982 A1	26-02-2015

WO 0236436	A1	10-05-2002	AU	1994602 A	15-05-2002
			CA	2436202 A1	10-05-2002
			CN	1473125 A	04-02-2004
			EP	1335857 A1	20-08-2003
			WO	0236436 A1	10-05-2002

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 13972078 B, Alain Cerf [0003]