

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

**0 329 291
A1**

(12)

EUROPEAN PATENT APPLICATION

(21) Application number: 89300694.0

(51) Int. Cl. 4: **D06B 1/08**

(22) Date of filing: 25.01.89

(30) Priority: 26.01.88 US 148584

(43) Date of publication of application:
23.08.89 Bulletin 89/34

(84) Designated Contracting States:
DE FR GB IT NL

(71) Applicant: **E.I. DU PONT DE NEMOURS AND
COMPANY**

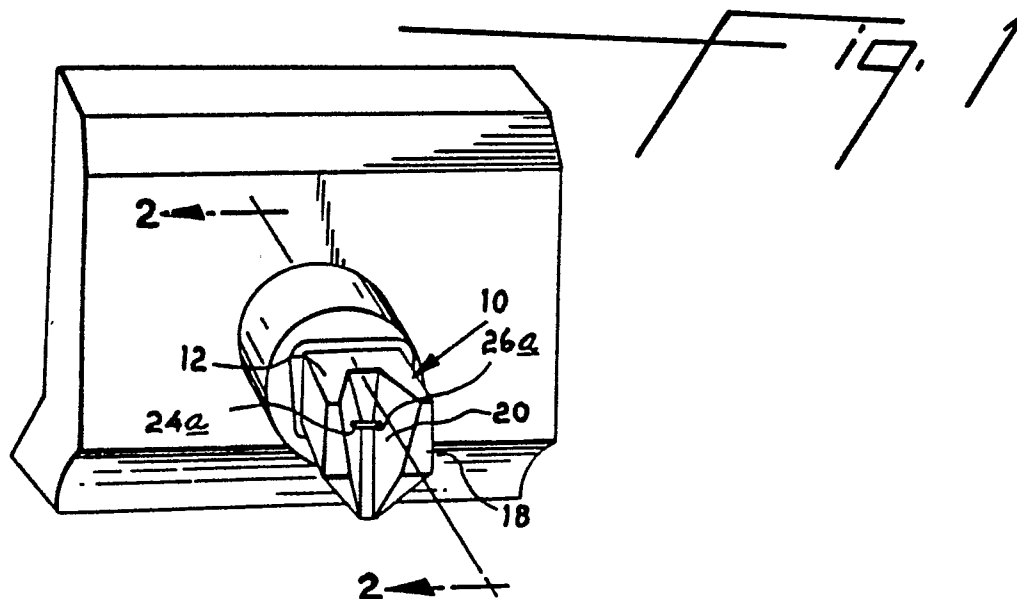
**1007 Market Street
Wilmington Delaware 19898(US)**

(72) Inventor: **Shah, Chandrakant Shantilal**
**915 Atlanta Circle
Seaford Delaware 19973(US)**

(74) Representative: **Jones, Alan John et al**
**CARPMAELS & RANSFORD 43 Bloomsbury
Square
London, WC1A 2RA(GB)**

(54) Yarn finish applicator.

(57) A yarn finish applicator in which finish is metered to a slot running from top to bottom of the applicator. The configuration of the body of the applicator's slot and the passage supplying liquid to the slot provide a slot configuration that is relatively insensitive to the yarn threadline alignment within the slot.



EP 0 329 291 A1

YARN FINISH APPLICATOR

Background of the Invention

This invention relates to an apparatus for applying liquid finish to a moving continuous filament yarn. More particularly, it relates to an improved groove-type finish applicator that provides uniform finish application to a moving continuous filament yarn with a capability to compensate for yarn misalignment in the slot.

U.S. Patent No. 4,397,164 of common assignee discloses a yarn finish applicator in which finish is metered to a slot running from top to bottom of the applicator. The configuration of the body of the applicator and its slot provides an edge at the exit end of the applicator and a slot that is slightly wider at the location at which finish is metered to the slot than at exit of the slot.

The yarn finish applicator includes a body member that has top, opposed side, front and back surfaces. A slot with bottom and side walls is formed in the front surface running from top to bottom of the body member. The slot has bottom and side walls with a passage connecting the back surface of the body member through which is metered the desired quantity of liquid finish. The lower portion of the front and back surfaces of the body member are angled downwardly toward each other and in conjunction with the opposed side surfaces which taper downwardly toward each other form an edge at the bottom wall of the slot. The side walls of the slot taper inwardly toward the bottom wall while tapering toward each other from top to bottom. This unique slot configuration not only facilitates placing the moving yarn line in the applicator slot but also prevents the finish from migrating by surface-tension-induced spreading away from the yarn path.

In the apparatus disclosed in the above-noted patent, liquid finish is applied to the yarn through a passage 30 in the bottom wall 28 of the slot 20. When the threadline is aligned in the slot a uniform finish application to the threadline results. However, it has been found that the requirements to adapt these applicators to certain existing equipment are extremely difficult to implement and as a consequence, on occasion, threadline misalignment occurs with respect to the slot in the applicator resulting in less than the desired uniformity of finish application to the threadline passing through the applicator.

Summary of the Invention

The present invention provides an improvement in the apparatus described in U.S. Patent No. 4,397,164. In the apparatus of the present invention, the passage supplying liquid to the slot extends through the bottom wall and partially up the side walls of the slot to provide a uniform finish application regardless of threadline alignment within the slot.

Brief Description of the Drawings

Fig. 1 is a perspective view of the finish applicator of this invention.

Fig. 2 is a cross-sectional view of Fig. 1 taken along line 2-2.

Fig. 3 is an enlarged view of the cross-sectioned applicator body member as seen in Fig. 2.

Fig. 4 is an enlarged front view of the applicator body member.

Detailed Description of the Preferred Embodiment

Referring to the drawings, the embodiment chosen for purposes of illustration includes an applicator body member 10, a pipe 13, and a bracket 15. The pipe 13 is held in a bore through the upper portion of bracket 15 by means of a set screw 17. The pipe is connected to a source of liquid finish (not shown) by means of fitting 19. The applicator body member 10 which is cemented into the outlet end of pipe 13 has a top surface 12, opposed side surfaces 14, 16 and a front surface 22 which terminates in a lower portion 22a. The slot 20 runs from the top surface 12 to the bottom of the applicator body member and is defined by side walls 24, 26 and bottom wall 28. A passage 30 is configured to connect the back surface 22 of the body member with the bottom wall 28 and sidewalls 24, 26 of the slot for supplying a liquid finish to the slot. More particularly, the passage 30 extends through the bottom wall 28 and through a portion 24a, 26a of each side wall 24, 26, adjacent the bottom wall. The side wall portions of slot 30 generally do not exceed 25 percent of the width of bottom wall 28 where the slot 30 extends through the bottom wall. The yarn 11 runs from top to bottom of the applicator as indicated by the arrow.

As best seen in Figs. 2-4 the slot 20 is defined by side walls 24, 26 and a bottom wall 28. The side walls 24, 26 taper inwardly toward each other as

they approach bottom wall 28 and also taper toward each other as they progress from top to bottom of the applicator body member. The configuration of the slot 20 is a critical feature of the invention. More particularly, the slot is tapered where the filament bundle of the moving yarn line 11 contacts the bottom wall 28. Finishing liquid is applied to the yarn at the initial point of contact with the bottom and/or side walls of the slot, as the case may be; i.e., at passage 30.

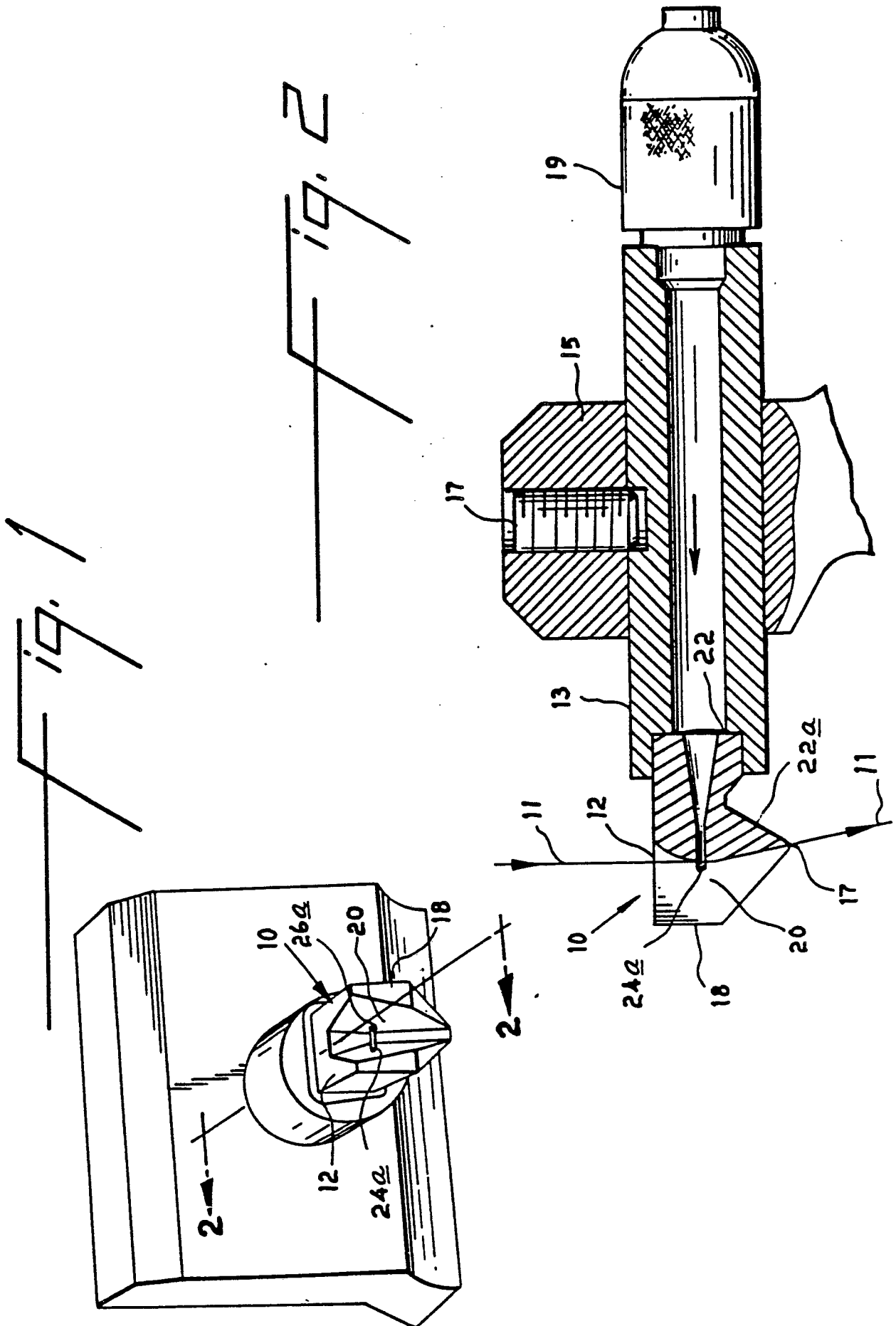
In operation, the yarn picks up finish at the point of initial yarn contact with the bottom wall or side walls of or both of the slot depending on threadline alignment in the slot at the location where finish is introduced through passage 30 and carries it forward along the tapered slot 20 and exits the slot tangentially with the bottom surface 28 with no separation between the bottom surface 28 and the threadline. The combination of the fully wiped bottom surface and the tangential exit of the yarn from the slot permits all of the finish to leave the slot with the yarn giving a uniform finish application on the yarn without the formation of drops at the exit end of the applicator.

The applicator of this invention may be used to apply liquid materials which are not harmful to the yarn or the applying system. Examples of liquids which may be applied are solutions, dyes, dispersions, or emulsions of conventional treating agents such as lubricants, antistatic agents, binders, softeners and the like. The liquid may be applied to such man-made continuous filament yarns as, for example, polyamides, polyesters, polyacrylics, spandex, rayon, and cellulose acetate.

Claims

1. In a yarn finish applicator that includes a body member having top, opposed side and front and back surfaces and a slot in the front surface running from top to bottom, said slot having bottom and side walls, and a passage connecting the back surface of the body member to the slot for supplying finish to said slot, the improvement comprising: said passage connecting said back surface of the body member to said slot by extending through the bottom wall of the slot and through a portion of each side wall adjacent said bottom wall.

2. The applicator as defined in claim 1, the bottom wall of said slot being angled toward the lower portion of the back surface from the passage to the edge and is progressively narrower in the direction of yarn travel.



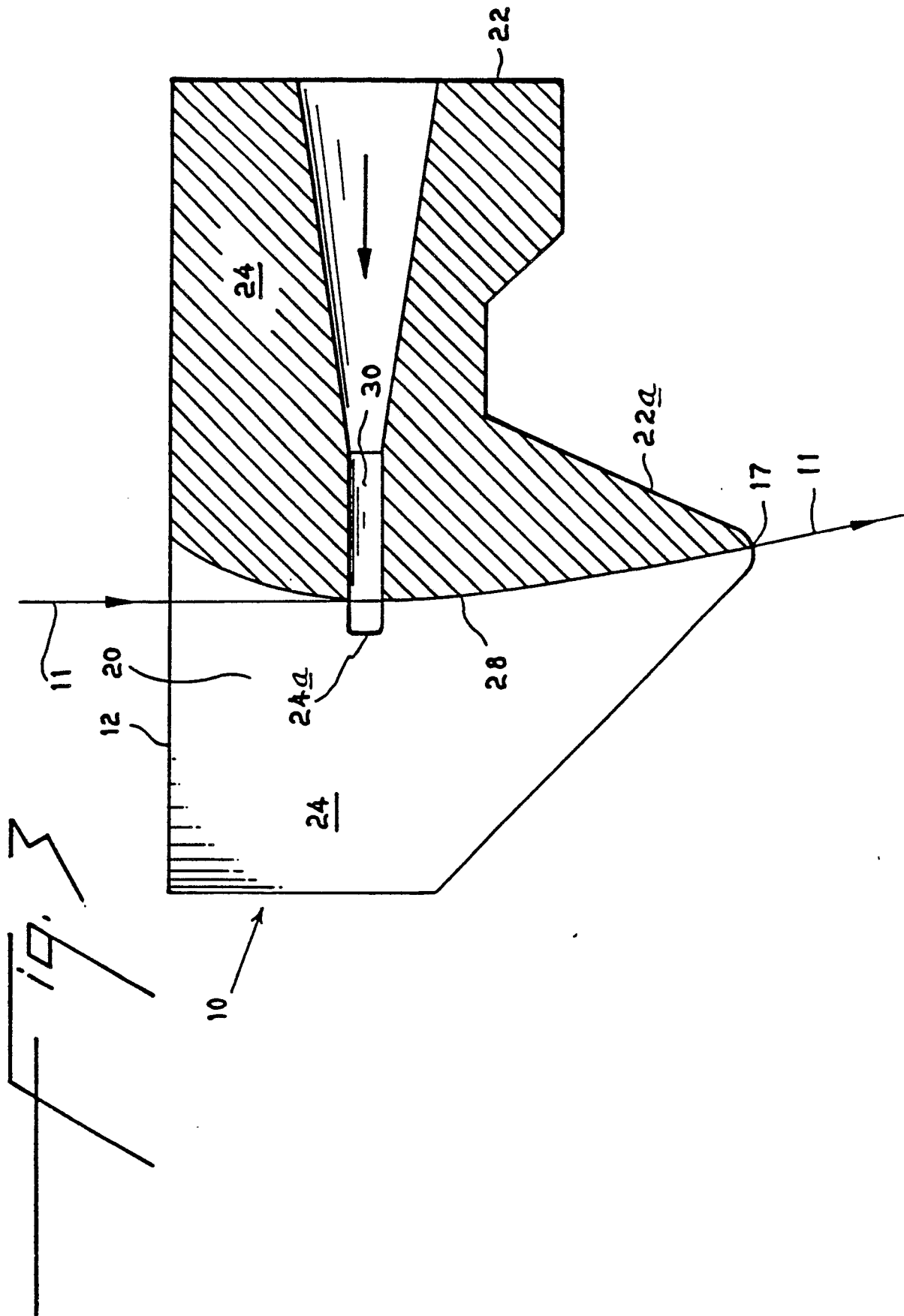
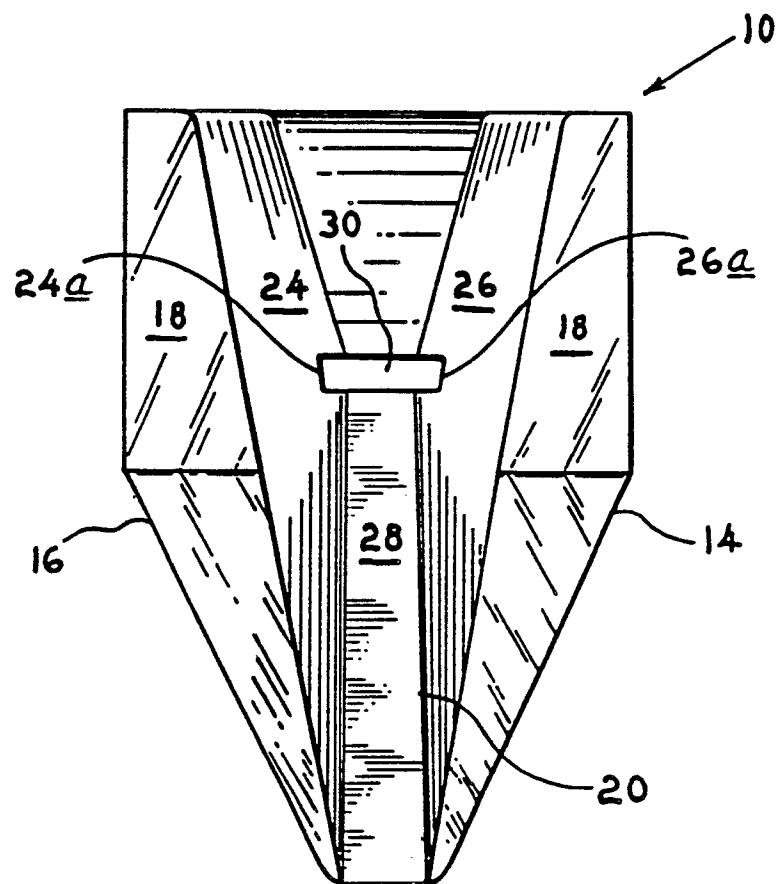


Fig. 4





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 30 0694

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.4)
X	US-A-4095558 (BAYER) * the whole document *	1	D06B1/08
X	GB-A-2079189 (HEBERLEIN) * the whole document * * with special mention for claim 6 *	1	
X	US-A-3766886 (MASCHINENFABRIK SCHWEITER) * the whole document *	1	
A	DE-A-3225844 (SPRIMAG SPRITZMASCHINENBAU)		
A	US-A-3253437 (MONSANTO)		
A	US-A-3244142 (E.I.DU PONT DE NEMOURS)		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.4)
			D06B
Place of search THE HAGUE		Date of completion of the search 03 MAY 89	Examiner PETIT J.P.
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 I : document cited for other reasons & : member of the same patent family, corresponding document			