



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 1 384 527 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
28.01.2004 Bulletin 2004/05

(51) Int Cl.7: **B07B 1/38**, B07B 1/46,
B07B 13/16

(21) Application number: **03015358.9**

(22) Date of filing: **08.07.2003**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IT LI LU MC NL PT RO SE SI SK TR**
Designated Extension States:
AL LT LV MK

(72) Inventors:
• **Santini, Gianattilio**
26039 Vescovato, (Cremona) (IT)
• **Livrieri, Filippo**
26100 Cremona (IT)

(30) Priority: **25.07.2002 IT MI20021645**

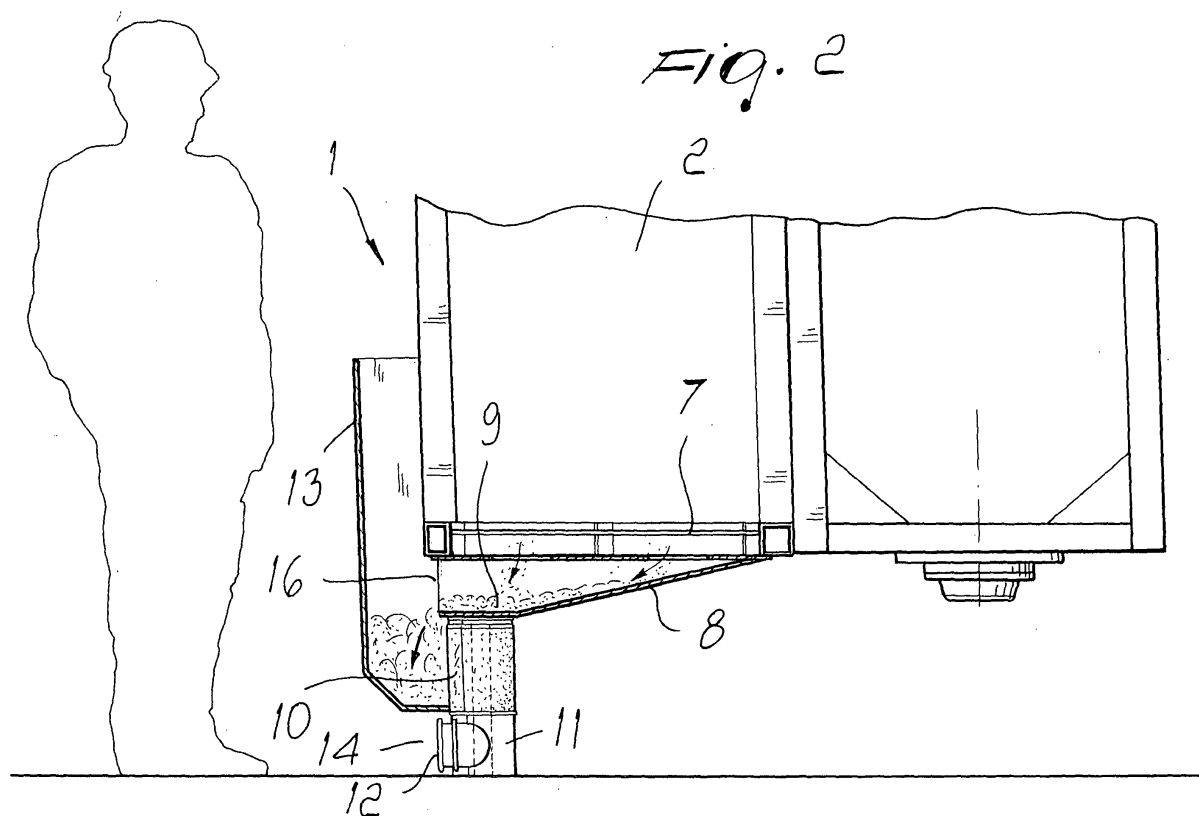
(74) Representative: **Forattini, Amelia et al**
c/o Internazionale Brevetti
Ingg. ZINI, MARANESI & C. S.r.l.
Piazza Castello 1
20121 Milano (IT)

(71) Applicant: **OCRIM S.p.A.**
26100 Cremona (CR) (IT)

(54) **Plansifter with Safer Sampling Device**

(57) A plansifter for separating products having different particle sizes, particularly cereals, which includes at least one screening channel (2) and is provided with a convey or device (8) that is arranged on the bottom

(7) of the channel and is suitable to convey the products in output from the channel to a remote position with respect to the moving parts of the sifter, so as to allow manual sampling in safe conditions for the operator.



EP 1 384 527 A1

Description

[0001] The present invention relates to a plansifter provided with a device that allows sampling in safety conditions for the operator.

[0002] The process performed in milling plants is substantially a sequence of operations for reducing the dimensions of the cereal (performed in roller mills) and of operations for separating the products according to particle size (performed in plansifters).

[0003] Among the various activities performed by milling plant operators, checking the intermediate products of this process to ensure that they have the expected quality is particularly important.

[0004] Any variation from the expected characteristics of these products require corrective actions, such as:

- adjustments of the distance between the rollers of the mills;
- adjustments of the rotation rate of the roller mill feeder rollers;
- replacement or modification of the cloths of the sieves of plansifters.

[0005] Mills and sifters are in fact the most important devices in the milling process and therefore the samplings required to check the intermediate products are performed at the output of these devices.

[0006] Milling plant operators, moreover, have the indispensable need to perform these samplings of the product by hand, in order to be able to assess directly and straightforwardly whether the characteristics of the products are the expected ones.

[0007] The "manual" sampling of the product, however, entails dangers for the safety of personnel, since in the absence of appropriate protections the personnel risks contact with moving machines or machine parts. The plansifter in fact contains at least one stack of sieves and has a means suitable to keep this stack of sieves under planar circular oscillation, so as to ensure the flow of the material to be sifted over the screening surfaces of the frames and therefore the separation action for which they are intended.

[0008] Plansifters are characterized by a mass that varies (depending on the number of channels) from a minimum of approximately 4000 kg to a maximum of approximately 7000 kg, by a rotation rate of approximately 220 rpm and by an eccentricity of motion in the steady state of approximately 40 mm, which can reach 80-110 mm during starting and stopping transients.

[0009] It is therefore evident that moving the body of the operator excessively close to the machine can entail the risk of contact with such a large rotating mass.

[0010] The aim of the present invention is to provide a plansifter that gives the operator improved assurances of safety during samplings of the intermediate product, and this aim is achieved with the plansifter according to

claim 1.

[0011] This aim and other objects are achieved with the plansifter according to claim 1. Preferred ways of carrying out the invention are apparent from the remaining claims.

[0012] The sifter according to the invention therefore offers the advantage of conveying the various products that exit from each individual channel to a position that lies far from the moving parts and is preferably protected from interference with them, allowing safe manual sampling of the products.

[0013] This and other advantages, purposes and characteristics are apparent from the figures that follow, which illustrate by way of non-limitative example an embodiment of the sifter according to the invention, and wherein:

Figure 1 is a view of a plansifter executed according to the prior art;

Figure 2 is a view of a detail of the plansifter according to the invention, provided with a safety conveyor;

Figure 3 is a perspective view of the conveyor of Figure 2.

[0014] With reference to the plansifter of Figure 1, it is composed of a plurality of screening channels 2, the bottom of each channel being provided with outlets 3 for the various products. Tube segments 4, arranged directly below the machine, convey these products in output from the sifter toward the loading tubes of the other treatment machines arranged at the lower levels. Sleeves 5 of flexible material provide the connection between the outlets 3 formed in the bottom of the channel and the tube segments 4, and are made of flexible material because they must provide the connection between a moving part (bottom of the sifter) and a fixed part (tube segments).

[0015] The sampling of the products at the outlet of the sifter 1 is currently performed by mill operators by inserting their hand in suitable openings 6 (known as ports) formed in the tube segments 4. However, the dimensions of the machines located at the level below the sieve and the large number of loading tubes make it impossible to perform manual sampling in points other than the specified one. Accordingly, the personnel is forced to perform product samplings by moving very close to the machine and, for ports located toward the center of the machine, even lie down underneath the machine.

[0016] The sifter according to the invention, shown in Figure 2, has on a bottom 7 of each channel 2 a device 8 for conveying the output products. The device 8 substantially consists of a hopper, which on one side receives the products that exit from the bottom 7 and on the other side conveys them toward an outlet 9 at which a sleeve 10 for each product is mounted.

[0017] In particular, the conveyor 8 has a plurality of

internal channels 15, each of which corresponds to the outlet of a respective product from the sifter 1, separately from the others.

[0018] Corresponding sleeves 10 are provided on the output section 16 for the exit of these products from the conveyor 8 and lead into corresponding tube segments 11, which are closed by movable plugs 12 and carry the product to a remote position outside the sifter. In this position, the operator can take easily the intended samples in safe conditions. Moreover, between the body of the sifter 1 and the operator there is advantageously an interposed fixed safety barrier or enclosure 13, which leaves a region 14 open at the outlet of the product from the tube segment 11.

[0019] The invention as described and illustrated is susceptible of modifications to provide variations that are nonetheless within the scope of the appended claims. Thus, for example, the shape of the conveyor 8 can be different from the illustrated one and the means used to separate the operator from the body of the machine can likewise be different.

Claims

1. A plansifter for separating products having different particle sizes, particularly cereals, comprising at least one screening channel, **characterized in that** it has a conveyor (8) arranged on the bottom (7) of said channel and suitable to convey the products in output from said channel to a remote position with respect to the moving parts of the sifter, so as to allow manual samplings in safe conditions for the operator.
2. The sifter according to claim 1, **characterized in that** said conveyor (8) is provided with a plurality of internal channels (15) for the separate conveyance of a corresponding product toward the respective output of said device.
3. The sifter according to claim 2, **characterized in that** sleeves (10) are provided on the output section (16) for the exit of said products from the conveyor (8) and connect said conveyor to tube segments (11) for discharging the products through openings closed by removable plugs (12).
4. The sifter according to one or more of the preceding claims, **characterized in that** it further has a safety barrier, which is interposed between the moving parts of the sifter and the region (14) for taking the samples at the output of said tube segments (11).
5. The sifter according to claim 4, **characterized in that** said safety barrier is constituted by a fixed enclosure (13).

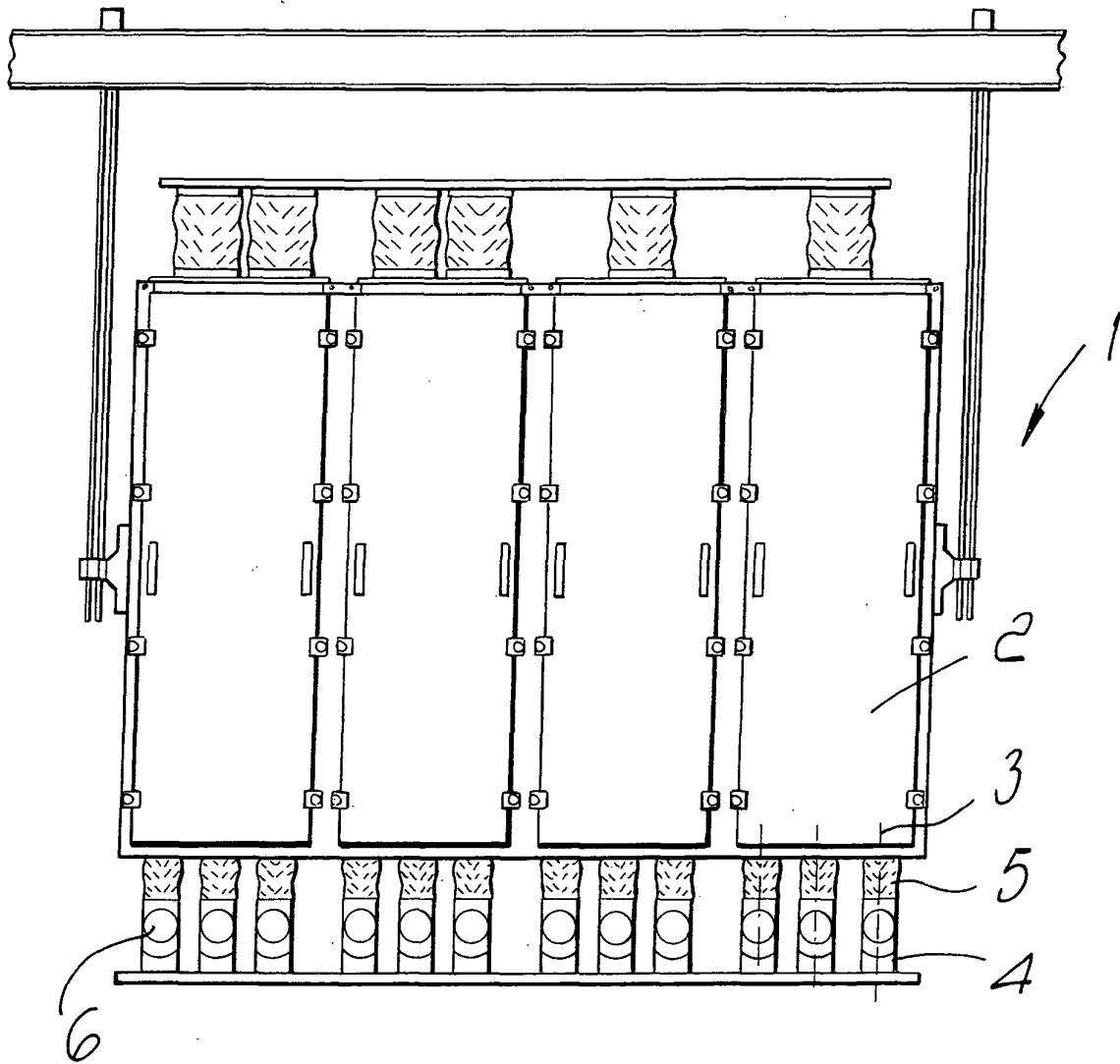
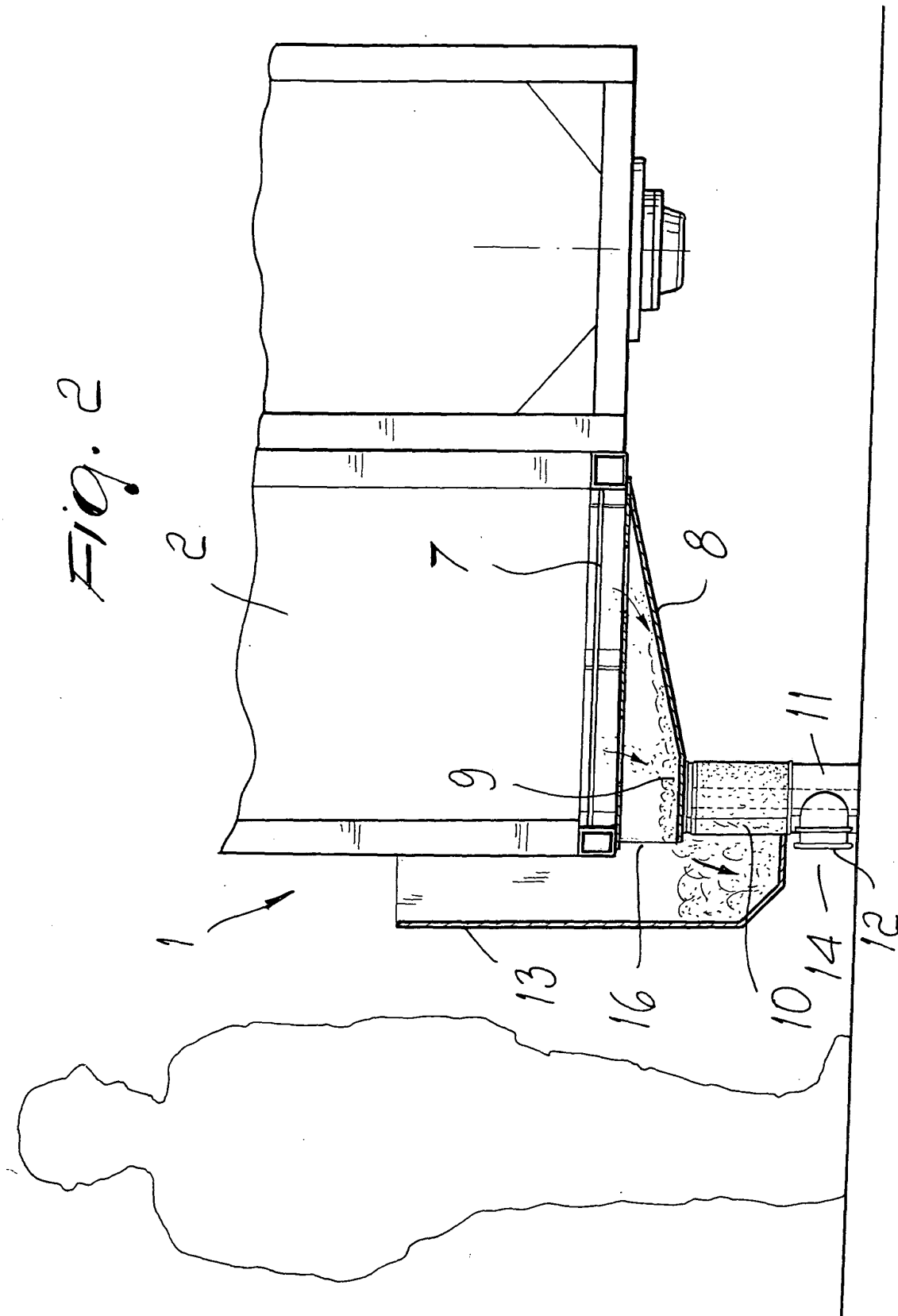


Fig. 1



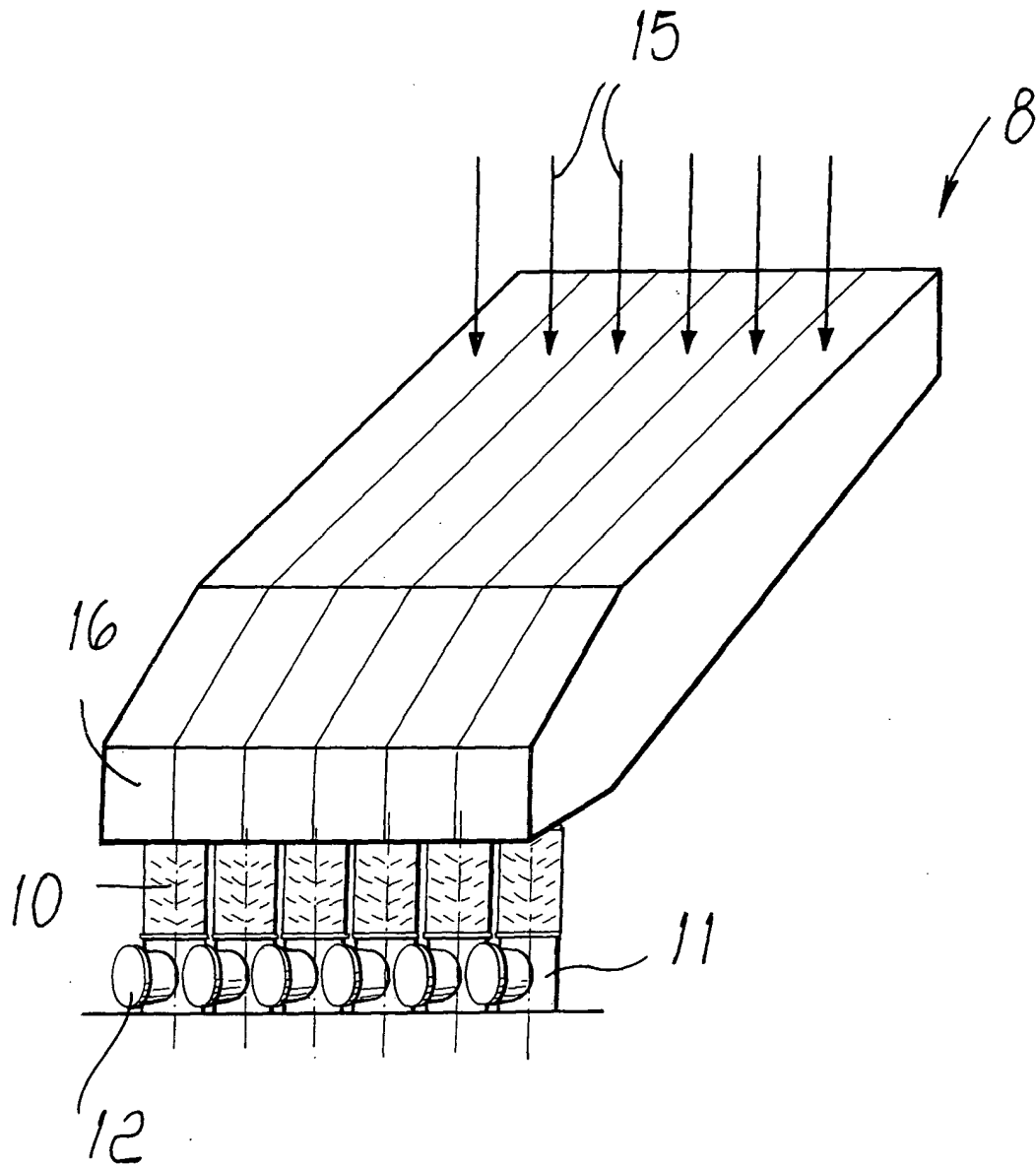


Fig. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 03 01 5358

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.7)
X	DE 563 439 C (GEBRÜDER BÜHLER) 5 November 1932 (1932-11-05) * the whole document *	1	B07B1/38 B07B1/46 B07B13/16
X	DE 948 835 C (GEBRÜDER BÜHLER) 6 September 1956 (1956-09-06) * the whole document *	1	
A	US 4 260 481 A (GEBRÜDER BÜHLER) 7 April 1981 (1981-04-07) * column 4, line 39 - line 49 * * figures 1-3 *	1,3	
A	FR 918 303 A (V. BUYS) 5 February 1947 (1947-02-05) * page 2, line 39 - line 54 * * figure 1 *	1,3	
A	CH 321 495 A (O. KNAUFF) 15 May 1957 (1957-05-15) * page 2, line 29 - line 40 * * figures 1-4 *	1	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B07B
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		17 October 2003	Laval, J
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 02 (P04C01)

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

EP 03 01 5358

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.

17-10-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 563439	C	05-11-1932	NONE	
DE 948835	C	06-09-1956	NONE	
US 4260481	A	07-04-1981	CH 631092 A5 AR 218124 A1 AU 525848 B2 AU 4530579 A BR 7902128 A CS 216657 B2 DE 2823623 A1 ES 476920 A1 FR 2424770 A1 GB 1602756 A IT 1110838 B JP 1357519 C JP 54146070 A JP 61024072 B SU 912036 A3 ZA 7807058 A	30-07-1982 15-05-1980 02-12-1982 08-11-1979 04-12-1979 26-11-1982 15-11-1979 16-05-1979 30-11-1979 18-11-1981 06-01-1986 13-01-1987 14-11-1979 09-06-1986 07-03-1982 28-11-1979
FR 918303	A	05-02-1947	NONE	
CH 321495	A	15-05-1957	NONE	

EPO FORM P0459

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