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EUROPEAN PATENT APPLICATION

(21) Application number : **93830217.1**

(51) Int. Cl.⁵ : **B65F 3/04**, B65F 1/00,
B65F 3/26

(22) Date of filing : **21.05.93**

(30) Priority : **19.06.92 IT BS920074**

(43) Date of publication of application :
05.01.94 Bulletin 94/01

(84) Designated Contracting States :
AT BE CH DE DK ES FR GB GR IE IT LI NL PT SE

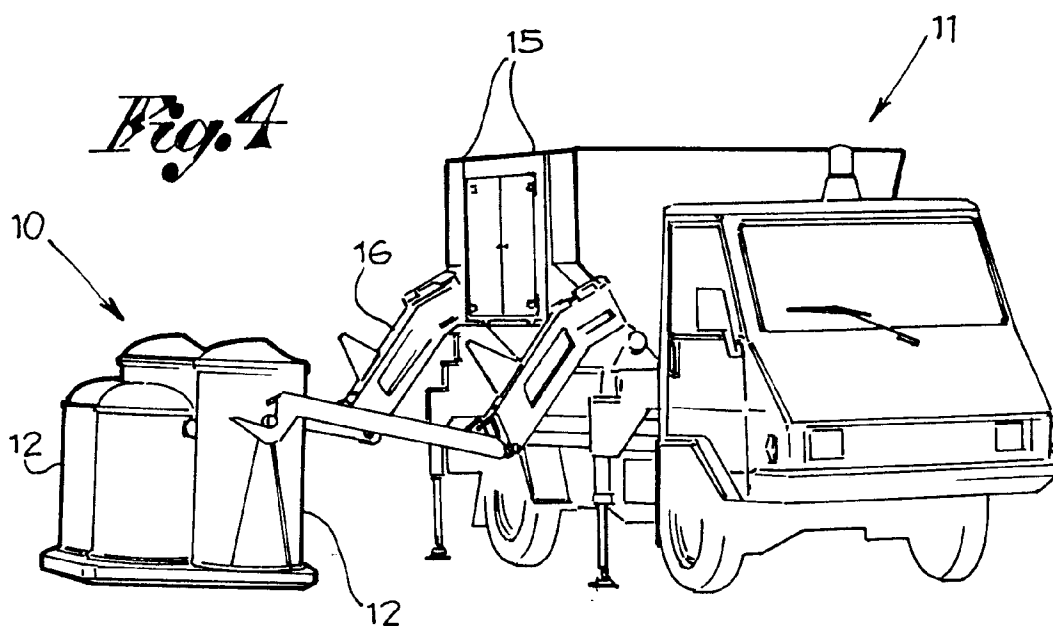
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(54) **Equipment for selective collecting, separate transport and disposal of different refuses.**

(57) An equipment for selective collecting, separate transport and disposal of different refuses comprising a collection unit (10) which includes a plurality of collection containers (12) located on and movable en bloc with, a common platform (13), and a loading and transport unit constituted by a vehicle (14) comprising on board boxes (15) corresponding in number to the collection containers (12) located on said platform, each of which is designed to receive material from one of the collection containers (12) and may be tipped laterally for emptying.



The present invention relates to differentiated collecting of domestic and non-domestic, recyclable, noxious or polluting waste and refuses. More particularly, the present invention relates to a an equipment for selective collecting, separate transport and disposal of different refuses such as glass, paper, tins, plastic, medicines, batteries and/or other wastes, which offers considerable advantages from both an economical and an ecological point of view.

Selective and separate collecting of wastes and refuses is getting more and more widespread, urged by a culture and by information which press for the recovery of recyclable materials and for the defence and protection of the environment from noxious and/or polluting products.

It is an object of the present invention to provide an equipment which allows to solve the problem of selective collecting in each step, from separate storing of refuses in the respective production places and their separate transport, to disposal in dumping grounds or in plants for the elimination of each material.

The object proposed is achieved by an equipment according to the invention which includes:

- a collection unit including a plurality of collection containers located on, and movable enbloc with, a common platform, each container being designed to receive a specific material;
- a loading and transport unit constituted by a vehicle comprising on board boxes corresponding in number to the collection containers located on said platform, each of which is designed to receive material from one of the collection containers located on said vehicle;
- a device designed to lift the platform with collection containers from the ground, raise it and position it onto said boxes in order to discharge the material from each container into a corresponding box and then lay the platform with empty containers back to the ground; and
- means for tipping each single box and for emptying all or some of the boxes on the vehicle laterally, at a disposal station or dumping ground adequately equipped for receiving materials collected separately.

Further details will become apparent from the continuation of the description of the invention, with reference to the accompanying pictures, in which:

Figure 1 shows a platform with a plurality of collection containers on the ground;

Figures 2 and 3 show the transport vehicle in driving configuration from two opposite views;

Figure 4 shows the vehicle during lifting of the platform with collection containers from the ground;

Figure 5 shows the transport vehicle during positioning of the platform with containers onto the boxes provided on the vehicle itself, to discharge

the material from the containers into the respective boxes; and

Figure 6 shows the vehicle during lateral discharge of the boxes.

The present equipment comprises essentially a unit 10 for separate collecting of refuses and a unit 11 for loading and transporting the material collected.

The collecting unit 10 comprises a plurality of collection containers 12, which may be connected to one another, located on, and movable enbloc with, a common platform 13. Each collection container 12 is designed to receive a specific material, such as paper, glass, plastic, tins, medicines, batteries, etc., which is introduced therein through a cover or through openings provided in the cover 12'. The collection containers 12 are preferably provided with a bottom proximate to an opening provided in the said platform, said bottom being openable by control in order to discharge the material in the container from the bottom.

As concerns platform 13, its special configuration permits to contemporarily support all the collection containers 12 and it is provided with means 13' which permit gripping of the platform by lifting means.

Loading and transport unit 11 is constituted by a self-propelled vehicle 14, for example a three-wheeler or any other vehicle. Said vehicle comprises on board boxes 15 corresponding in number to the collection containers 12 located on said platform. Each box 15 is designed to receive material from one of the said collection containers 12.

Transport vehicle 14 is equipped with a handling device 16 suitable for lifting platform 13 with collection containers 12 from the ground, raising it and positioning it onto the boxes 15 located on the vehicle and then laying the platform with empty containers back to the ground. Moreover, the boxes 15, or only some of them, are mounted on the vehicle pivoted at 15' and controlled by a hydraulic actuator - not shown in the photos - which causes tipping and emptying of each single box from one side of the vehicle. Untipping boxes, if any, may be provided with an access door or with an openable bottom for being emptied.

The use of the equipment described herein can be immediately understood also by examining the accompanying pictures.

Figure 1 shows platform 13 on the ground and individually accessible collection containers 12 for receiving the different materials collected separately.

Figures 2 and 3 show the transport unit in driving configuration with a possible arrangement the boxes 15 on the vehicle.

Figure 4 shows platform 13 being lifted from the ground contemporarily with all containers 12 by means of the handling device 16 located on the vehicle and suitable for positioning the said platform, with the containers in upright position, onto boxes 15, as

shown in Figure 5.

In this condition, the opening of the bottoms of containers 12 permits the materials contained therein to be discharged from said containers into the boxes 15 and to accumulate progressively, but always separately. Hooks located on the edges of each box, or hydraulic means located among the boxes and fed and operated by the vehicle hydraulic circuit, may be provided for actuating opening of the container bottoms.

Once collection is finished - or once the boxes are full - the vehicle will make for a collection or disposal station or a dumping ground, where the boxes will be tipped individually - see Figure 6 - so as to discharge and send each material to the destination it is intended for, separately from all other materials.

The transport unit may then get back to its driving configuration and start a new collection round.

In the description of the invention, explicit reference is made to a plurality of collection containers mounted on one only platform for contemporary displacement thereof. Nevertheless always within the scope of the inventive concept - the function thus described may also be accomplished by a number of containers integrally formed in one only structure, i.e. with containers divided into compartments designed to receive the different materials.

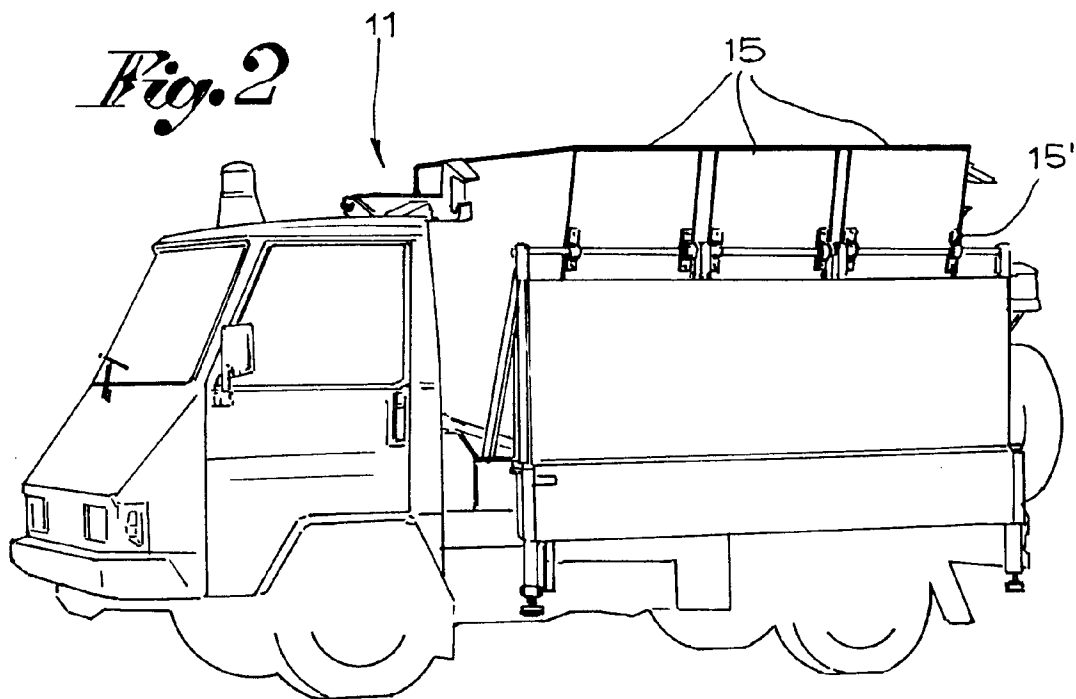
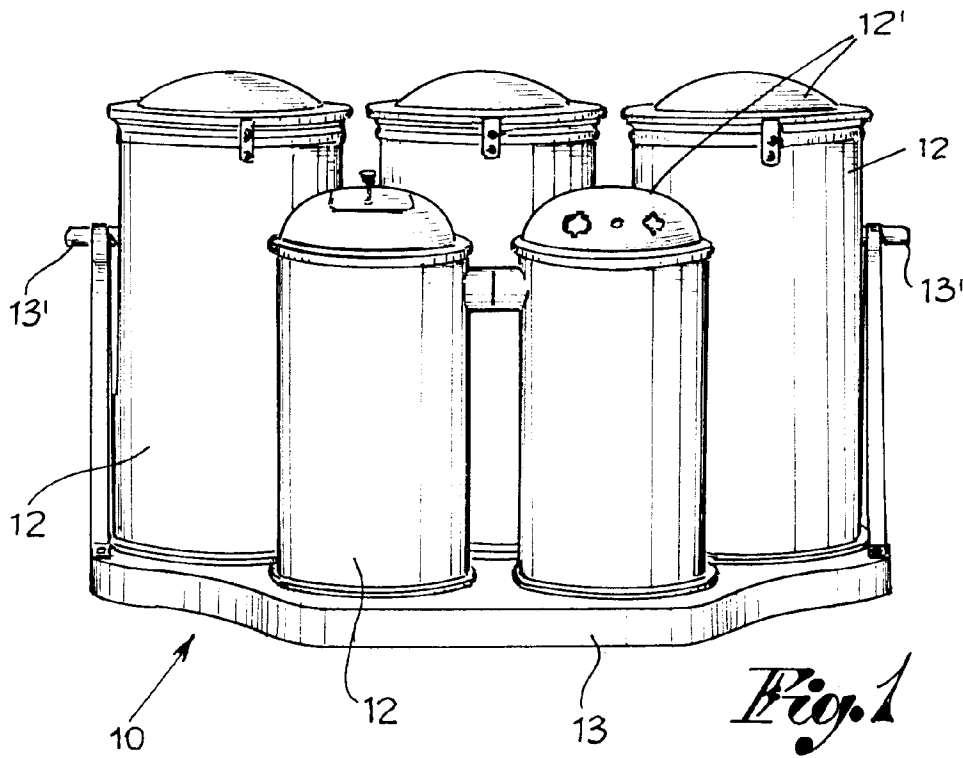
Claims

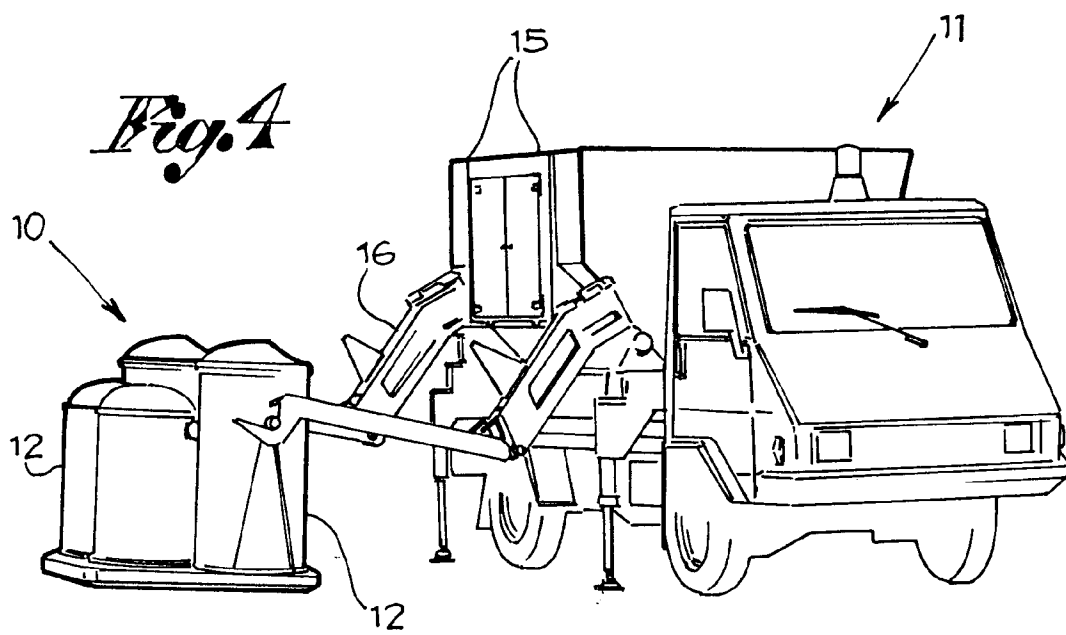
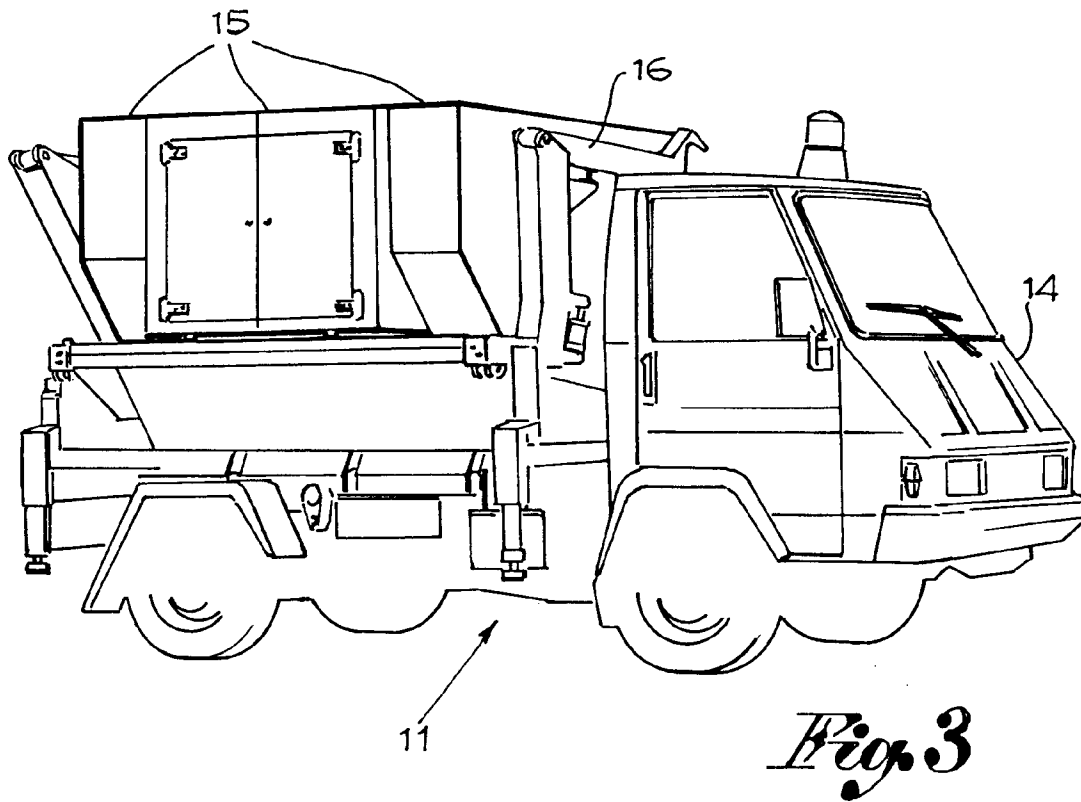
1. An equipment for selective collecting, separate transport and disposal of different refuses comprising a collection unit (10) for each different material and a loading and transport unit 11 for the materials collected, characterized in that

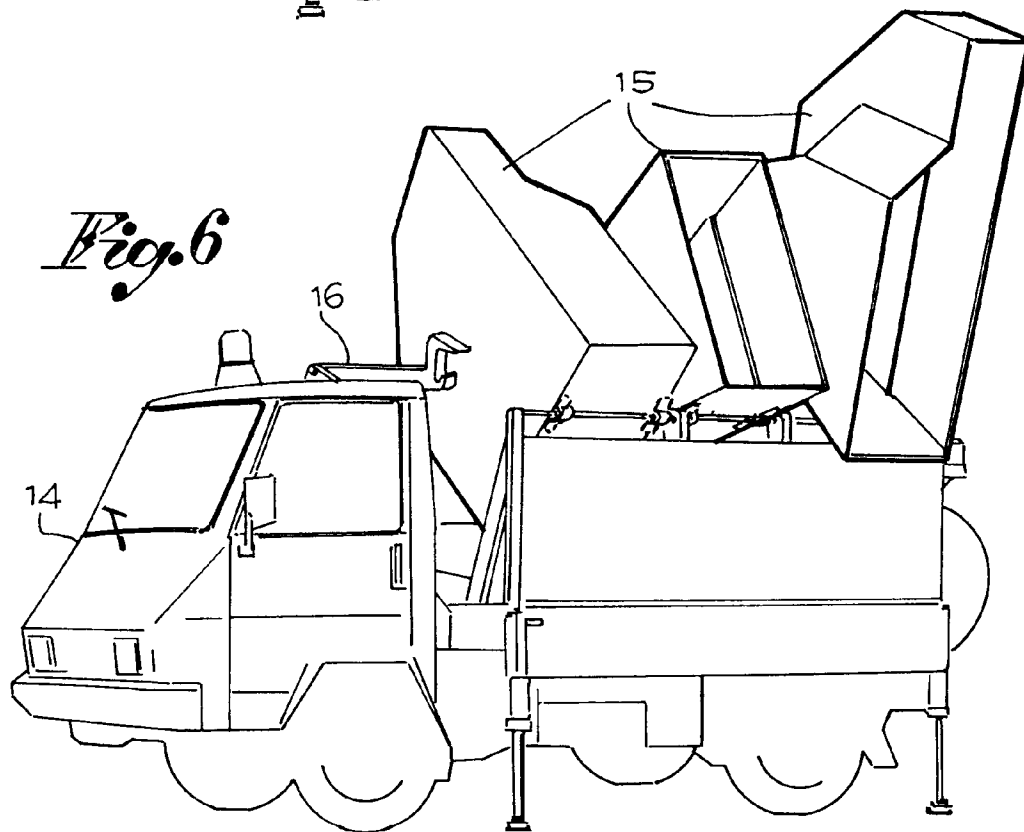
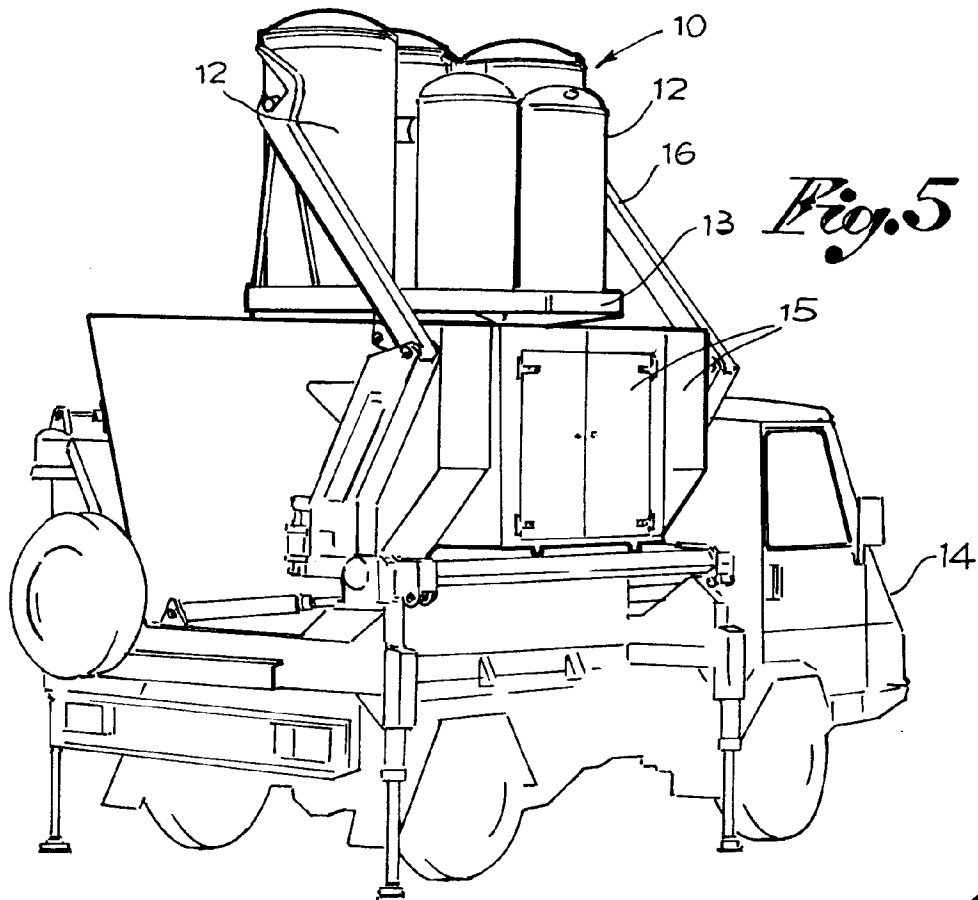
- said collection unit 10 comprises a plurality of collection containers (12) located on and movable enbloc with, a common platform (13), each container (12) being designed to receive a specific material;
- the loading and transport unit is constituted by a vehicle (14) comprising on board boxes (15) corresponding in number to the collection containers (12) located on said platform, each of which is designed to receive material from one of the collection containers (12); and
- the said vehicle is also provided
 - i) with a handling device (16) designed to lift the platform (13) with collection containers (12) from the ground, raise it and position it onto said boxes in order to discharge the material from each collection container (12) into a corresponding box (15) and then lay the platform with empty containers back to the ground and
 - ii) with means (15') for tipping each single box and for emptying all or some of the boxes on

the vehicle laterally, at a disposal station or dumping ground adequately equipped for receiving materials collected separately.

2. An equipment as claimed in claim 1., wherein the said containers (12) are applied and fixed to the common platform (13) and provided with covers or top openings which permit material to be introduced therein, and with openable bottoms which permit material to be discharged from below, said openable bottoms being placed proximate to corresponding openings provided in the platform.
3. An equipment as claimed in claim 1. wherein the said handling device (16) comprises two arms tipping towards one side of the vehicle, which interact for gripping and lifting the platform with collection containers.
4. An equipment as claimed in claim 1, wherein at least some of the boxes (15) located on the transport vehicle are pivoted at a shaft and controlled and tipped by a pneumatic actuator.









European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

EP 93 83 0217

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.5)
A	US-A-4 960 220 (U. FOA) * column 2, line 56 - column 5, line 33 * * figures 3-5 *	1-3	B65F3/04 B65F1/00 B65F3/26
A	GB-A-2 240 914 (G. HENLEY) * the whole document *	1,2	
A	DE-A-4 001 768 (D-TEAM DESIGN GMBH) * column 6, line 43 - column 15, line 62 * * figures 1-11 *	1,2	
A	AT-B-386 582 (BETONWERK HÖRSCHING LEITL) * the whole document *	1,2	
A	US-A-4 979 866 (M. CROY) * column 4, line 58 - column 5, line 25 * * figures 1,2 *	4	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B65F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 29 SEPTEMBER 1993	Examiner SMOLDERS R.C.H.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>			

EPO FORM 1503 03.82 (P0401)