A cassette (1) having spaced individual compartments (2) formed in a flat body (1). A lid (4) is provided to cover the body and the lid has openings corresponding to, or in register with, the compartments. A removable cover (8) is inserted between the body and the cover for blocking the passage of seeds (3) through the openings (5) in the lid. Sowing of the seed is facilitated by being thus segregated in the individualized compartments and being available for individualized distribution or sowing through the openings when the cover is removed.
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Description

Cassette for Sowing Seed

Background of the Invention

The invention relates to a cassette intended to carry seeds for sowing which are separated or segregated from each other, comprising a flat body containing longitudinal and transverse rows of compartments each for retaining a single seed for sowing one at a time. The compartments are open on one side to accommodate the feeding of the seeds. A lid is provided to cover that side of the body in which the open sides of the compartments are located.

A similar cassette is disclosed in United States Letters Patent No. 4,221,175 which includes a shallow dish in the base of which the longitudinal and transverse rows of slots are formed. After the compartments have been filled with seeds by the seed supplier, a recessed lid is put in place to retain the seeds in their respective compartments. With this manner of packaging, the seeds can be transported to the growers. In a special apparatus, which is explained in the aforesaid United States patent, the grower can then spread the seeds by means of tubes and distribute them into growing compartments of seed boxes or similar containers where the seeds can develop in suitable growing medium. The advantage of storing seeds in a cassette is that they are protected against moisture and other unfavorable influences from outside. Furthermore, the sowing is made easier in this way.

The prior seed cassettes, however, require a
complex seed mechanism and complicated means of removing the seeds from the cassette preparatory to sowing. In the first instance the lid has to be removed, the dish with the compartments has to be placed in a lower block, and on top of that a solid upper block has to be placed. In this upper block channels are located which correspond with the compartments. Diagonally through each transverse row of compartments or slots runs a rotating member which closes off the channels, but which by rotation of more than 180° can transport more seeds. This occurs when both blocks have been rotated over 180° and placed above the sowing tubes of the seeding apparatus. This obviously requires extensive preparation and complicated procedures to achieve proper results.

The cassette of the present invention provides a structure from which the seed can be easily placed into the sowing tubes without an auxiliary device. This is attained by providing lids with openings which correspond to the compartments in the body. A piece of cover-forming material (such as paper, foil, etc.) is placed between the body and the lid which can be easily removed by sliding it away.

The seed-filled cassettes need only be placed in an upside-down position above the tubes in such a way that an opening in the lid and a compartment in the body correspond with a tube to communicate therewith. Nevertheless, the seeds cannot fall out of the cassette because they are retained by the cover material. After this material has been manually pulled away, the slots are connected to the tubes and the seeds fall down through the tubes into the seed planting hole in the growing medium in any desired
Since the lid is identical to the body, in addition to which the compartments of each body or lid are open at both ends, a very simple further process is possible because a number of bodies or lids are united in a stacking cassette and a removable cover is present between each body or lid stacked on top of each other. In this manner a stacking cassette is formed whereby it is unnecessary to turn the cassette before seeding and, further, the cassette has a much larger seeding capacity. Moreover, the construction is much simpler and cheaper.

Summary of the Invention

It has been found that seeds can be carried in a package having individually spaced compartments in a flat body so as to be ready for sowing utilizing apparatus having individual tubes, each receiving individualized seeds from a respective compartment for sowing. The body has a lid with openings in register with the compartments and a removable cover is interposed between the lid and the body to block the openings in the compartments until sowing is to take place by opening the compartments to respective sowing tubes. Provision is made for stacking multiple cassettes for sequentially connecting the compartments of respective cassettes to the tubes of the sowing apparatus.

Brief Description of the-Drawings

The construction designed to carry out the invention will be hereinafter described, together with other features thereof.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings forming a part
thereof, wherein an example of the invention is shown and wherein:

Figure 1 is a plan view illustrating a seed cassette constructed in accordance with the invention,

Figure 2 is a sectional elevation taken on the line TT-TT in Figure 1,

Figure 3 illustrates a seed cassette according to Figures 1 and 2 in the operating position above the seeding installation,

Figure 4 is a plan view of an alternate form of the invention illustrating a seed cassette in an empty position, constructed as a stacking cassette, and

Figure 5 is a sectional elevation taken on the line V-V of Figure 4.

Description of a Preferred Embodiment

Referring more particularly to the drawings a seeding cassette is illustrated including a shell 1 formed from synthetic material, in which longitudinal and transverse rows of compartments 2 are formed therein. Every compartment is meant to accept a seed 3. From Figure 2 it is evident that the circumference of the shell or body 1 is constructed as a flanged edge, with the aid of which the shell 1 can rest on an underlayer (not shown).

The shape of the shell 1 and of the recesses or compartments 2 is such that in an empty position the shells 1 can be nestled into each other for storage and transport.

The seed cassette consists, in addition to the shell 1, of a flat lid which is in preference manufactured by an injection moulding process and of which the wall thickness is greater than the wall...
thickness of the shell, so that the lid 4 has a greater rigidity. In the lid 4, openings 5 are present which correspond with the recesses 2 in the shell 1 when the lid 4 is in place.

When the recesses 2 of the shell 1 are filled with seeds 3, the lid 4 will then be connected to the shell 1 by means of snapping together or similar clamping means. The construction of the clamping connection is, for example, formed by extra recessed rows 6 on both longitudinal sides of the shell 1 in which ridges 7 on the lid fit tightly. These recesses 6 can have the same form and measurements as the recesses 2; however, they also can be larger or smaller. It is self-evident that other detachable connections are conceivable and possible.

When the lid 4 with the ridges 7 is pressed into the recesses 6, the lid 4 will then be held in respect of the shell 1. However, because of the presence of the openings 5 in the lid 4, the recesses 2 are not closed off at the top. In order to achieve this closure a strip of paper, foil or similar material is placed between the lid 4 and the upper wall of the shell 1 to form a cover 8. It will be clear that the cover or strip 8 shall not be wider than is necessary or possible. The strip 8 is provided with a handle 9 which may be made more rigid.

When, before placing the lid 4 into position, the strip 8 has been placed onto the shell 1, it will become evident that no direct connection exists between the recesses 2 and the openings 5. The filled and closed-off cassette can therefore be transported in any position. The intention is that several
grower who will grow plants from the seeds 3.

The cultivation of plants from seeds often takes place mainly in seed boxes or the like, using as an example a seed box with a surface area of 600 x 400 mm. Such a seed box (not illustrated) will be placed under a seeding installation as illustrated in the above United States patent as outlined in Figure 3. The seeding installation consists of a frame 10 with through-channels 11 and sowing tubes connected to that at 12. The bottom ends of the tubes 12 are positioned above the exact spot over the seed box where the seed is to fall. The seed cassette, according to the invention, will now be placed in the frame 10 in a turned position of over 180°. Because of the presence of the cover strip 8 in the seed cassette, the seeds 3 cannot fall via the openings 5 into the tubes 12. That is only possible when the strip 8 has been pulled to the right by means of the handle 9. After the removal of the strip 8, all seeds from the seed cassette fall into the tubes 12 belonging to the installation and from there into the seed holes of the seed box and the like.

It will be clear that the seed cassette according to the invention can be used in a much simpler way than the seed cassette according to the aforementioned patent. After the seed cassette has been emptied it may be returned to the seed merchant for refilling.

It will be clear that it will be desirable to indicate on the seed cassette which type of seed it contains. This can easily be placed on the handle 9, because this handle 9 protrudes outside the seed cassette.
has sown, generally places a sticker or the like in the seed box. To aid the grower in this procedure, it may be desirable to manufacture the handle 9 as such a sticker. This handle 9 may then be pulled off the strip 8 and can, for instance, be placed straight up in the seed box.

There is no special material requirements of the strip 8. The only condition is that no seeds can possibly pass through the material. In general, a paper strip would be all that is required. The shell 1 and the lid 4 may be manufactured of synthetic material in any desirable way. As the lid must be rigid in order to form a good seal from the dish, the lid 4, in preference, needs to be made from synthetic material by moulding. The shell 1 can be manufactured using thin synthetic material.

It is, of course, possible to manufacture the shell 1 from a thicker plate in which the recesses are placed. This is also the case with the second form of construction according to Figures 4 and 5. It is apparent form these drawings that a number of identical rectangular rigid plates 20 are connected to each other with clamping cams (not shown) with corresponding holes along both edges. These plates may be nearly identical with the lids 4 of the first form of construction (see Figure 2) although they are thicker.

The plates 20 contain holes 21 open on both sides in which just one seed can be taken at a time; for example, clamping five (more or less) such plates 20 on top of each other along the side edges.

Every plate 20 is made slightly deeper on one side over the whole surface, which is covered by the
As shown in Figure 4 this recess is bordered by three edges 22, 23 and 24. In these recesses a piece of removable cover-forming material fits. In a stacking cassette of five plates 20, four pieces of cover-forming material are present, corresponding to the covers of the first construction form.

In order to fill this stacking cassette with seeds the top three pieces 25 are removed. The seeds will fall in the holes 21 of the lowest plate 20, these holes being closed off underneath by the lowest piece of cover material.

When the plate 20 is filled, the holes 21 will be covered at the top by sliding in a piece of the cover material 25. The next plate 20 will then be filled as so on, until the top plate 20 is filled and closed off by the cover material 25.

If a stacking cassette consists of five plates 20, only three can be filled with seeds. The number of unfilled plates 20 is always two, however high the stack is made.

In order to sow the seeds, a seeding apparatus is used again as in Figure 3. The stacking cassette does not need to be turned and all the plates 20 can stay connected to each other.

The lowest cover material 25 is removed by sliding out. The seeds from the lowest plate 20 will now fall down through the opening 21 in the lowest plate 20 and into the channels 11 of the seeding installation. In this way the succeeding 20 plates 20 can be emptied serially.

It is also possible to start filling the stacking cassette by connecting the two bottom plates 20 together with the cover material in between. When the
next plate 20 and the next cover 25 is put into place. In this way one can make sure that all openings 21 are filled with seeds. The rigid plates 20 which form the stacking cassette can also be connected to each other by different means than the before mentioned clamping cams. It may be possible to provide threaded ends with retaining nuts, as used with the connection of washer plates, or in ultrasonic welding. In this case the plates 20 of the stacking cassette are permanently connected to each other along the edges.

While a preferred embodiment of the invention has been described using specific terms, such description is for illustrative purposes only and it is to be understood that changes and variations may be made without departing from the spirit or scope of the following claims.
What is claimed is:

1. A cassette for carrying sowing seeds separated from each other comprising:
   a flat body;
   spaced compartments formed in said body each for containing at least one seed;
   said body being open on one side to accommodate the feeding of the seeds into the compartments;
   a lid to cover said open side of the body in which the open sides of the compartments are located;
   said lid having openings which correspond with the compartments; and
   a removable cover material carried between said body and said lid.

2. The structure set forth in Claim 1 wherein the lid is connected to the body solely along the longitudinal outside edges.

3. The structure set forth in Claim 2 including fastening means having bulges and bulging clamping cams formed in the lid and body.

4. The structure set forth in Claim 3 wherein the lid is co-extensive with the body, whereby the compartments in each body and lid are open and aligned so that a number of bodies or lids are united as a stacking cassette, and a piece of removable cover-forming material between each body and lid.

5. The structure set forth in Claim 4 wherein the cover material which sticks out of the cassette contains indicia identifying the seeds contained in the cassette and which can also be used to identify the seed after sowing in growing medium.
**INTERNATIONAL SEARCH REPORT**

**I. CLASSIFICATION OF SUBJECT MATTER**

According to International Patent Classification (IPC) or to both National Classification and IPC

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**II. FIELDS SEARCHED**

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Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in the Fields Searched

**III. DOCUMENTS CONSIDERED TO BE RELEVANT**

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<td>U.S. A, 3,820,655 (TOURETTE ET AL) 28 June 1974</td>
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<td>U.S. A, 4,080,755 (CROSBY) 28 March 1978</td>
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<td>U.S. A, 4,221,175 (VAN WINGERDEN ET AL) 09 September 1980</td>
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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
  - **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.
  - **A** document member of the same patent family

**IV. CERTIFICATION**

Date of the Actual Completion of the International Search: 12 July 1983

Date of Mailing of this International Search Report: 15 JUL 1983

International Searching Authority: ISA/US

Signature of Authorized Officer: [Signature]

Form PCT/ISA/210 (second sheet) (October 1981)