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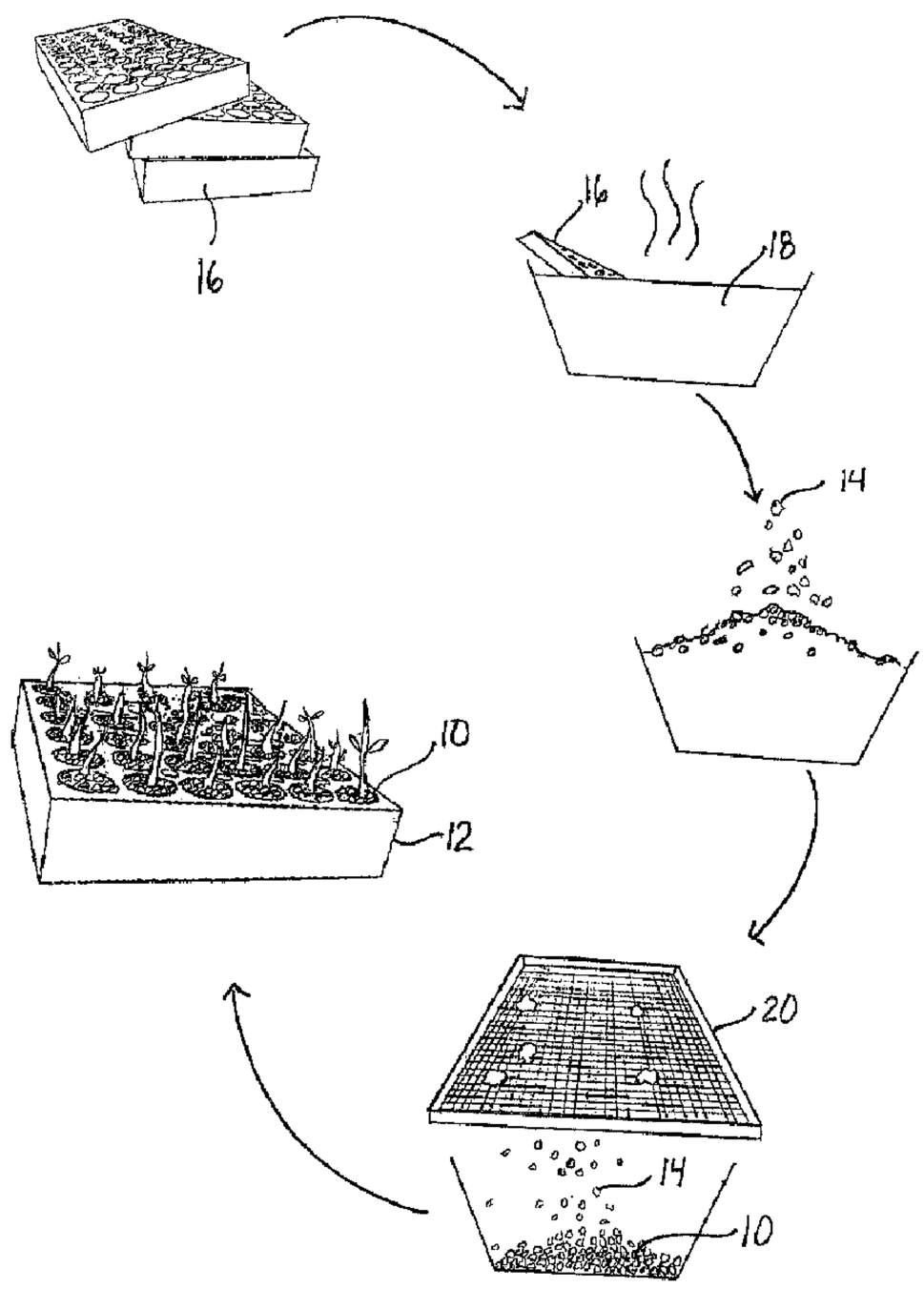
(72) Inventeur/Inventor:
MCCARTHY, R. GRANT, CA

(73) Propriétaire/Owner:
BEAVER PLASTICS LTD., CA

(74) Agent: THOMPSON, DOUGLAS B.

(54) Titre : RECOUVREMENT GRANULAIRE POUR CONTENANT DE SEMIS
(54) Title: TOP DRESSING FOR SEEDLING CONTAINERS



(57) Abrégé/Abstract:
A top dressing for seedling containers which consists of particles of expanded polystyrene having a density of not less than 10 pounds per cubic foot and not more than 35 pounds per cubic foot. It is preferred that the top dressing be made by recycling used seedling containers.

ABSTRACT OF THE DISCLOSURE

A top dressing for seedling containers which consists of particles of expanded polystyrene having a density of not less than 10 pounds per cubic foot and not more than 35 pounds per cubic foot. It is preferred that the top dressing be made by recycling used seedling containers.

TITLE OF THE INVENTION:

Top dressing for seedling containers

FIELD OF THE INVENTION

The present invention relates to a top dressing for seedling containers and, in particular, seedling containers used by greenhouses.

BACKGROUND OF THE INVENTION

Granite grit has been used as a top dressing for container grown tree seedlings since the beginning of commercial container growing some 30 years ago. Granite grit represents a significant annual input cost to the seedlinq nurseries. Many problems have been identified over the years with the use of granite grit and as commercial tree seedling nurseries have become larger, more automated, and generally more sophisticated, these problems caused by the granite grit top dressing have become more evident.

Some of these problems are that the granite grit is heavy, approximately 90 lbs/ft, this results in handling problems and worker complaints such as back injuries. Furthermore, because of the very abrasive nature of the grit particles there is significant wear and abrasion of machinery on the seeding assembly line. Another problem that arises is that the fine particles and dust which are an inherent part of the granite grit result in a "cementing crust" when subjected to normal misting in the germination of seedlings. This cementing crust results in decreased germination. The dust also results in allergy problems for some nursery workers. It has also been found that in the hot part of the day granite grit will in some instances absorb enough heat to raise its temperature to a level that will burn the stem of the seedlings This effect can result in reduced yield of viable seedlings.

SUMMARY OF THE INVENTION

What is required is a top dressing that can substitute for granite grit without some or all of the disadvantages inherent in granite grit.

According to the present invention there is provided a top dressing for seedling containers which consists of particles of expanded polystyrene having a density of not less than 10 pounds per cubic foot and not more than 35 pounds per cubic foot.

The inspiration to use expanded polystyrene as top dressing came from a recycling problem which greenhouses are presently struggling with. Every greenhouse has a disposal problem with used expanded polystyrene seedling containers. It was discovered, however, that the problem of recycling the seedling containers to turn them into top dressing was not as straightforward as had been hoped. Expanded polystyrene foam has a density of approximately 2 pounds per cubic foot. Simply grinding up the expanded polystyrene foam seedling containers to form grit was not workable. The polystyrene foam grit was too light in weight. The top dressing blew away in even a light wind and was washed away by water from automated sprinkler systems. The polystyrene foam can be reprocessed back to polystyrene by application of heat and pressure. However, polystyrene has a density of approximately 60 pounds per cubic foot. This was still viewed as being too heavy for handling.

In order to arrive at the expanded polystyrene grit, as described above, measures had to be taken to densify the expanded polystyrene foam material to a density range of not less than 10 pounds per cubic foot and not more than 35 pounds per cubic foot, which was found to be best suited for a top dressing application. The expanded polystyrene foam was then ground to form grit and screened to provide a relatively consistent particular size and shape. In trials, it was determined that an optimum density is between 15 pounds per cubic foot and 25 pounds per cubic foot. A number of further advantages to the use of such expanded polystyrene top dressing were determined, as will be hereinafter further described.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent from the following description in which reference is made to the appended drawings, the drawings are

for the purpose of illustration only and are not intended to in any way limit the scope of the invention to the particular embodiment or embodiments shown, wherein:

The FIGURE is a processing flow diagram illustrating the manufacture and use of the top dressing in accordance with the teachings of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment, a top dressing for seedling containers generally identified by reference numeral 10, will now be described with reference to **the FIGURE**.

Referring to **the FIGURE**, there is provided a top dressing 10 for seedling containers 12. Top dressing 10 includes particles 14 of expanded polystyrene having a density of not less than 10 pounds per cubic foot and not more than 35 pounds per cubic foot. Research was conducted to determine what range of density was suitable for a top dressing application. It was determined that less than 10 pounds per cubic foot was too light and was prone to being washed or blown away. It was determined that over 35 pounds per cubic foot was too heavy for the seedlings and created handling problems for nursery personnel. The optimum density was determined to be within a narrower range of not less than 15 pounds per cubic foot and not more than 25 pounds per cubic foot. Top dressing 10 has a minimum particle size of not less than 1 mm and a maximum particle size of not more than 4.5.

In the illustrated embodiment, the source of the expanded polystyrene is recycled material recovered from used seedling trays 16. As illustrated in **The FIGURE**, used seedling trays 16 are collected and melted down. The melted material 18 is then cooled and ground up into particles 14. Particles 14 are then passed through a filter screen 20 to ensure that particles 14 less than 1 mm and a larger than 4.5 are removed. Particles 14 which pass through screen 20 can then be used as top dressing 10 for seedling containers 12. Particles which are unable to pass through screen 20 are viewed as being unsuitable. Particles which are deemed to be too small are removed for the purpose of reducing annoying dust. A small amount of dust is not detrimental; as it does not form a cementing crust, as is the case with granite grit dust. This is an important attribute of the material, because 100% dust removal is

not usually practical.

Advantages:

The following have been found to be advantages associated with use of top dressing 10 as described above:

(a) Optimum density resulting in a good stable top dressing without the excess weight.

(b) Particles of polystyrene are non abrasive and therefore present no problem to nursery equipment.

(c) Any fine particles or dust do not cement together as a result of watering and therefore there is no crust formed to interfere with germination.

(d) The top dressing produced from EPS in the density range of 20 to 25 lbs/ft has sufficient insulation value that it acts as a buffer to intense heat. eliminates the problem of the granite grit which absorb heat and burns the delicate stem of the new seedling.

(e) Preliminary growing trials suggest there is a 3 to 4 day saving in germination time when using this new top dressing vs. using conventional granite grit. The reasons for this are not entirely understood at this time however the result is very significant to the grower.

(f) In the first part of the production process the EPS foam is compressed and densified. To accomplish this the material temperature is raised to the melting temperature of polystyrene. This high temperature exposure inherently results in a more sterile product than conventional granite grit.

(g) Easier thinning of seedlings has emerged as an unexpected benefit. Granite grit top dressing results in a dark background colour and it is not easy to see the number of seedlings in one cavity. On the other hand our new top dressing gives a perfect

background colour for this purpose and so the thinning job can be done faster and with minimum eye strain.

(h) Tree seedling nurseries who use seedling containers manufactured from expandable polystyrene are concerned about the disposal of used containers in an environmentally sensitive manner. The scrap EPS to be densified and processed into this new top dressing will be primarily "used and discarded" seedling containers from the nursery operation. This concept has been a major driving force in the development of this new top dressing because it simultaneously solves a major disposal problem which has plagued the nursery industry. This is a problem which becomes more acute with each passing year as production capacity increases and at the same time disposal problems become more of an environmental issue. Turning the scrap seedling containers into a top dressing material to be used in the same nursery has obvious logistical and economic benefits. The process equipment for converting the used seedling containers into top dressing will be mobile and therefore can be moved as required to locations where large quantities of used seedling containers have accumulated. The location where seedling containers are used is of course the same location where the top dressing is required.

(i) The production of the new top dressing material by this method is a controlled manufacturing process. This means that there will be a consistency in the product which will be a great benefit to the nursery. Lack of consistency from batch to batch and from year to year has been a recurring complaint of nurseries using granite grit.

In this patent document, the word "comprising" is used in its non-limiting sense to mean that items following the word are included, but items not specifically mentioned are not excluded. A reference to an element by the indefinite article "a" does not exclude the possibility that more than one of the element is present, unless the context clearly requires that there be one and only one of the elements.

It will be apparent to one skilled in the art that modifications may be made to the illustrated embodiment without departing from the spirit and scope of the invention as hereinafter defined in the Claims.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

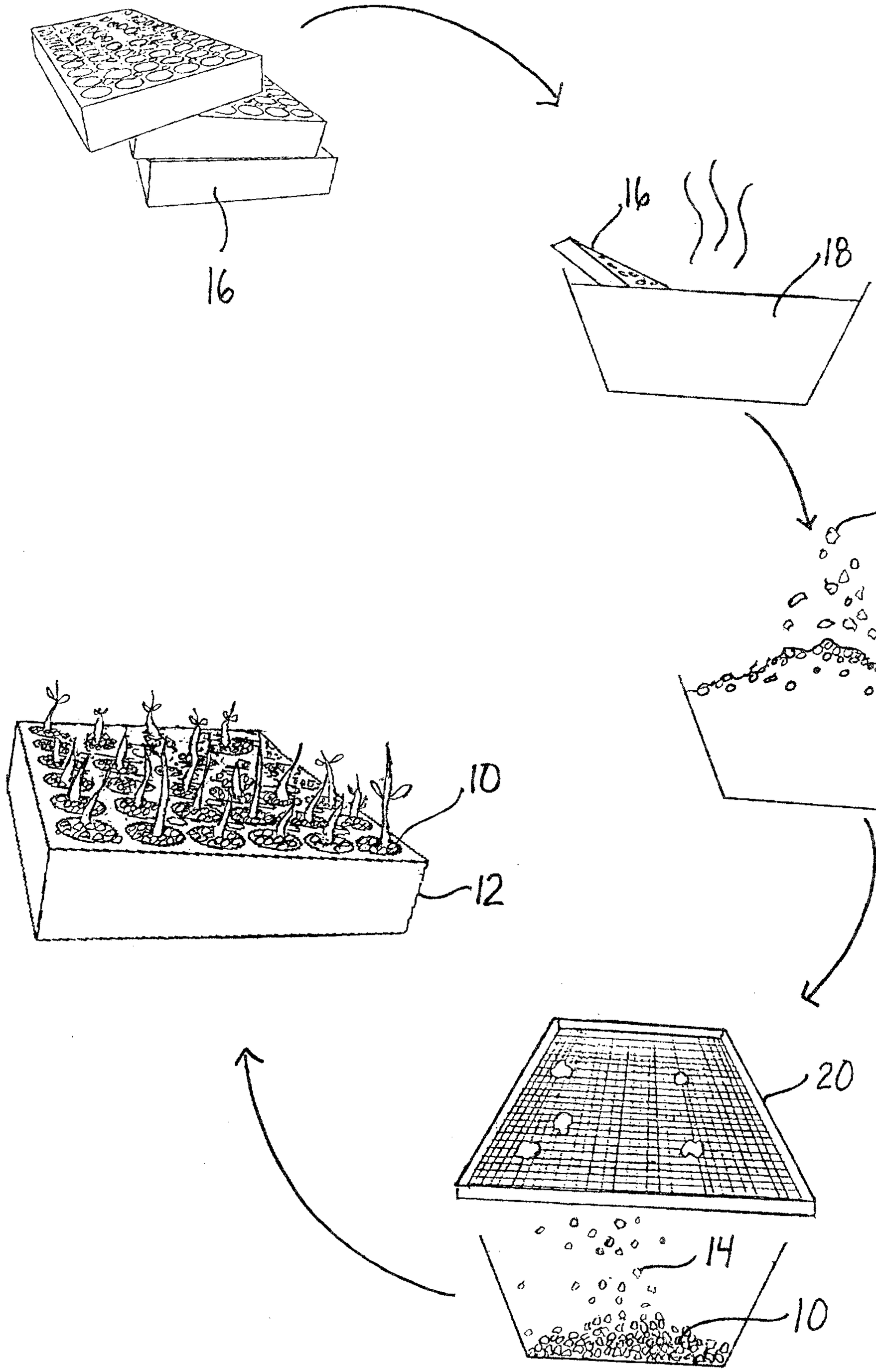
1. A top dressing for seedling containers, the top dressing comprising:

particles of expanded polystyrene having a density of not less than 15 pounds per cubic foot and not more than 25 pounds per cubic foot, and a minimum particle size of at least 1 mm and a maximum particle size of not more than 4.5 mm.

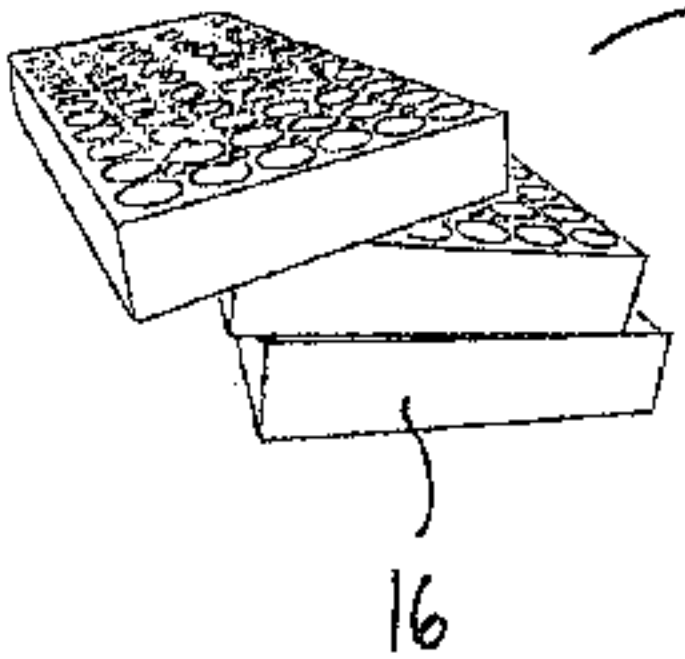
2. The top dressing as defined in Claim 1, wherein the expanded polystyrene is recycled material recovered from used seedling trays.

3. A germination top dressing for seedling containers, the germination top dressing decreasing a germination duration for a seed and comprising:

particles of expanded polystyrene having a density of not less than 15 pounds per cubic foot and not more than 25 pounds per cubic foot, a minimum particle size of at least 1 mm and a maximum particle size of not more than 4.5 mm and the top dressing having some residual dust particles of expanded polystyrene whereby the top dressing provides sufficient insulation to decrease the germination duration for a seed.



The FIGURE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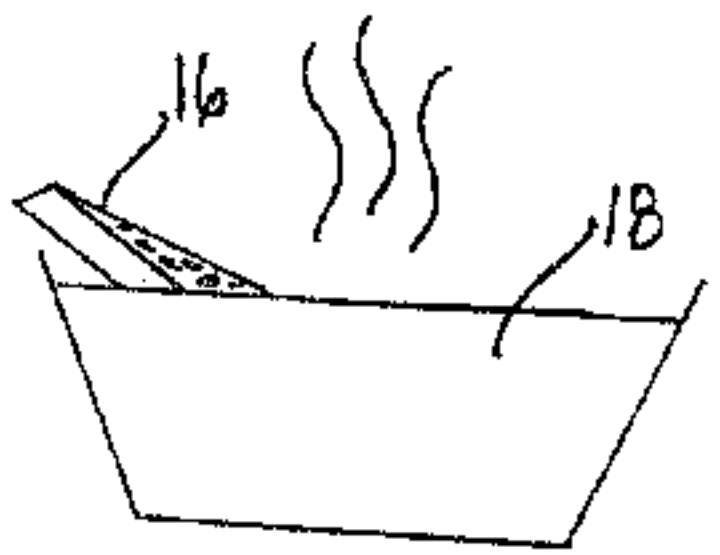
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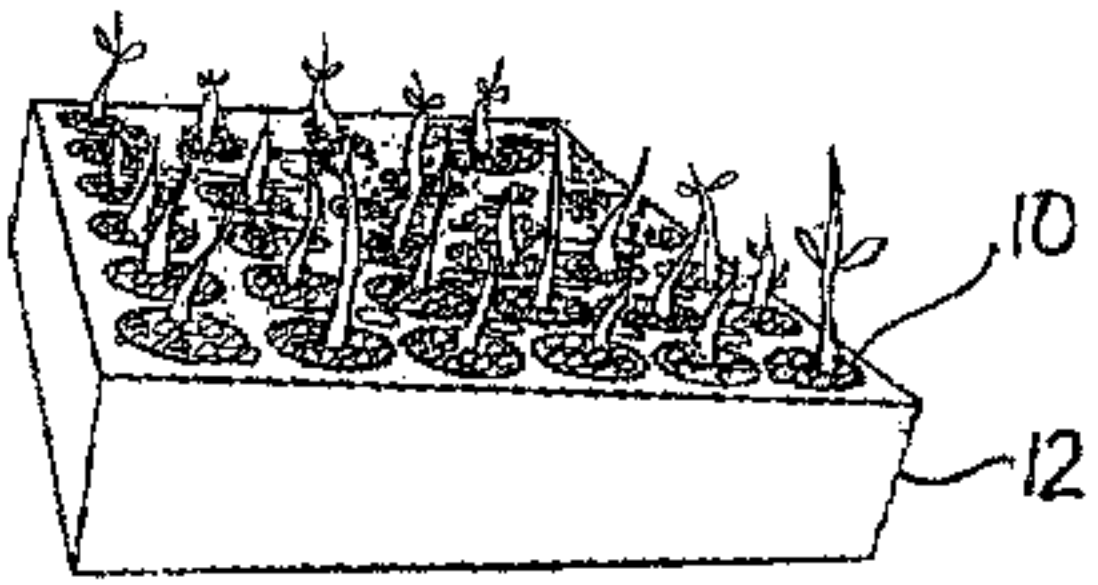
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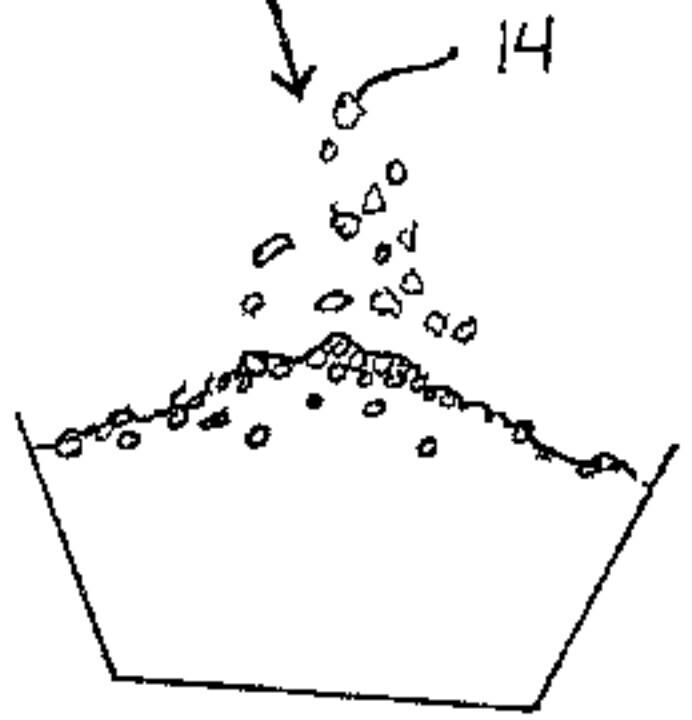
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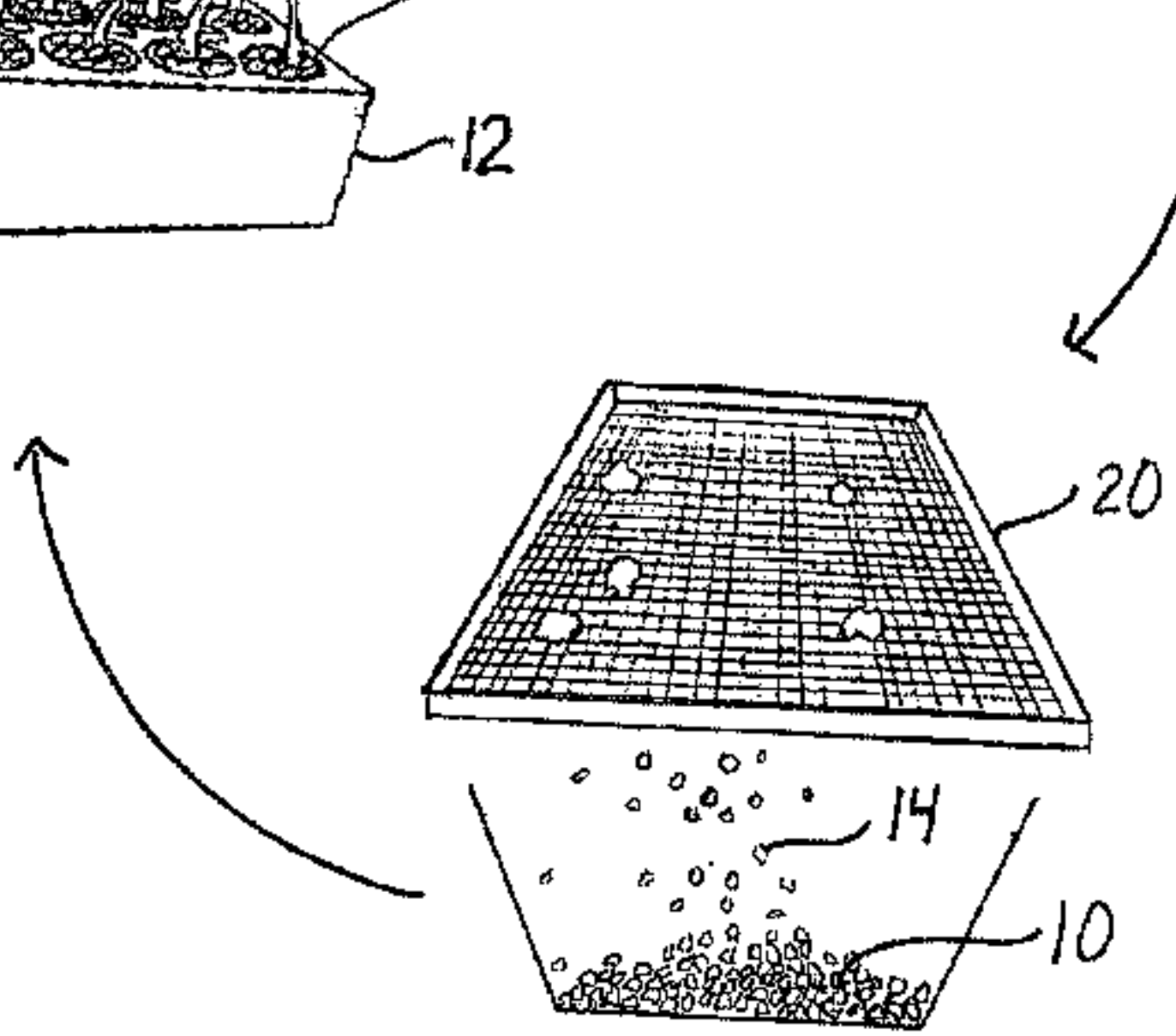
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