

A seed cum fertilizer sowing machine comprising a box, a cultivator and an armature wheel;

said box defining a section 2 for holding seeds and section 3 for holding fertilizer; said section 2 having a shaft 4 and section 3 having a shaft 5, both the shaft being driven by a chain 6 which is in communication with the said armature wheel as herein described; said box having a plurality of disc washer slide 7 bearing different sized holes for controlling the flow of the fertilizer & seeds and locked through a straight lock rod 12; said box having a lever 13 attached to it to start or stop the flow of the fertilizer & seeds; said box being in communication with a funnel 14 for supplying seeds to the ground through a pipe 16 & with a funnel 15 for supplying the fertilizer to the ground through a pipe 17; said box being connected to the cultivator through a stand 11 and cultivator frame 26;

said cultivator having a leveler 23, box tines 18 & 27, a plurality of front tines 20 and a plurality of rear tines 28 connected to the cultivator frame 26; said each front tine being attached with a spade 22, a collar 21 and a pipe 19; said each rear tine being attached with a plough 30, a stopper 31 and a pipe 29;

wherein the distance between said front and rear tines is adjustable and is atleast 10 cms.

I claim:

1. A seed cum fertilizer sowing machine comprising a box, a cultivator and an armature wheel;

said box defining a section 2 for holding seeds and section 3 for holding fertilizer; said section 2 having a shaft 4 and section 3 having a shaft 5, both the shaft being driven by a chain 6 which is in communication with the said armature wheel as herein described; said box having a plurality of disc washer slide 7 bearing different sized holes for controlling the flow of the fertilizer & seeds and locked through a straight lock rod 12; said box having a lever 13 attached to it to start or stop the flow of the fertilizer & seeds; said box being in communication with a funnel 14 for supplying seeds to the ground through a pipe 16 & with a funnel 15 for supplying the fertilizer to the ground through a pipe 17; said box being connected to the cultivator through a stand 11 and cultivator frame 26;

said cultivator having a leveler 23, box tines 18 & 27, a plurality of front tines 20 and a plurality of rear tines 28 connected to the cultivator frame 26; said each front tine being attached with a spade 22, a collar 21 and a pipe 19; said each rear tine being attached with a plough 30, a stopper 31 and a pipe 29;

wherein the distance between said front and rear tines is adjustable and is atleast 10 cms.

2. A seed cum fertilizer sowing machine as claimed in claim 1 wherein the said front tine is atleast one in number.
3. A seed cum fertilizer sowing machine as claimed in claim 1 wherein the leveler is a plank.
4. A seed cum fertilizer sowing machine as claimed in claim 1 wherein the said rear tine is atleast one in number.
5. A seed cum fertilizer sowing machine as claimed in claim 1 wherein the front tine is thicker than the rear tine.

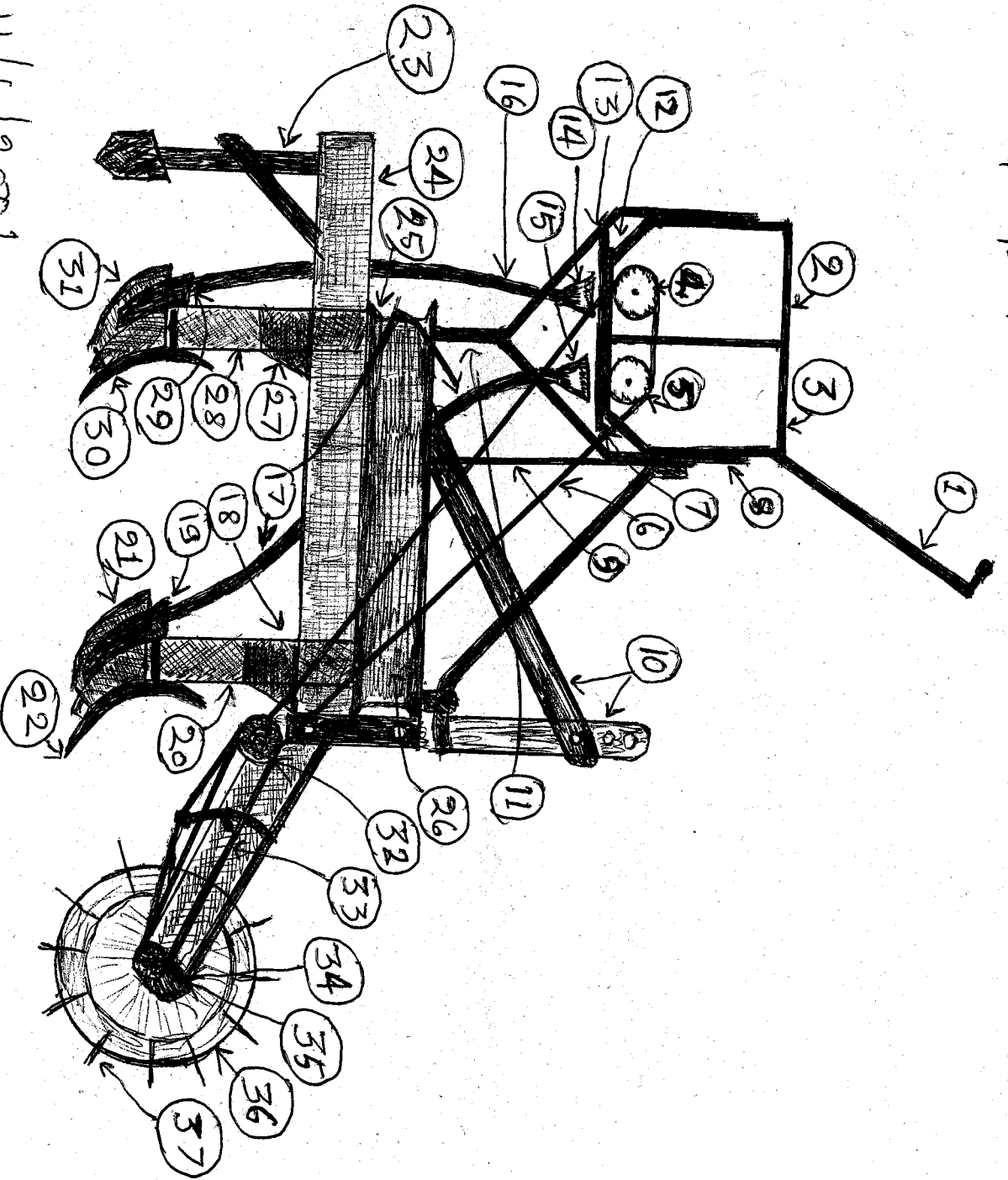
6. A seed cum fertilizer sowing machine substantially as herein described with reference to the accompanying drawing.

Date: 3/6/02

Signature of the applicant:

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Field of Invention

The present invention relates to a seed cum fertilizer sowing machine for sowing seeds and applying fertilizer at different depths of soil.

Background of Invention

In traditional agriculture the farmer uses the one box seed drill to sow seeds as well as to spread fertilizer with the result that both the fertilizer and the seeds are deposited at the same spot and at the same depth. When the seeds sprout, the weaker seedlings are unable to withstand the heat generated by the fertilizer and wilt and the stronger seedlings that survive soon grow roots beyond the layer in which the fertilizer exits. In this way the crop does not get the full benefit of the fertilizer. The farmer seeing his weakening crop, disregards scientific counsel and applies more fertilizer to the field, incurring more expenses, but benefits little from it. Excess fertilizer contributes to the degradation of the land.

To counter this problem agricultural scientists advise farmers to first plough the field thoroughly and apply fertilizer and then sow the seeds over the layer of the fertilizer. However, even this has disadvantages. It is seen that even after doing this, the seeds are not uniformly broadcasted, with some falling well below the layer of fertilizer, some far above and some at the level of the fertilizer. Also this method requires the farmer to work his field twice, with additional costs and labour involved. Although this method produces better yield, the farmer incurred extra costs.

In view of all these problems, first a two box seed cum fertilizer was devised which was initially pulled by bullocks and later attached to a tractor. This contraption applies the fertilizer and the seeds to the stipulated depth simultaneously. This invention thus has a potential to benefit the farmers immensely and increase their yields substantially at the same time saving them time, labour and money.

Accordingly this machine can bring about a substantial reduction in the wastage of fertilizer. It can also considerably reduce the damage caused to the

soil by the excessive use of chemical fertilizers. Using this machine farmer can sow and fertilize different types of crops of both rabi and kharif cycle as per the scientific requirement of each crop and by reducing the amount of fertilizer needed, can bring about a major gain to farmers in terms of input costs. At the same time, by getting bumper crops from their fields farmers stand to gain economically, The reduced use of fertilizers also keeps their soil healthy for the next crop. Since there are separate containers for the seeds and the fertilizer, the left over seeds and fertilizer do not mix and can be removed and stored separately for future use. Since the crop uses the full amount of the fertilizer applied, phosphatic layers do not form over the fields. This keeps the soil porous and absorbs all the rainwater, thus increasing the ground water storage. Therefore, this machine also makes a significant contribution to water conservation.

Detailed description of the invention

The present invention can be pulled by both bullocks and tractor, as it has been developed in two different sizes. This machine can apply fertilizer and seeds simultaneously. The front legs of the machine inject fertilizer into the soil and the rear legs sow the seeds. The distance between the front and rear legs can be adjusted to a minimum of 10 cms and the upper limit is as per the requirements of the crop. The machine requires atleast one type of seed and one type of fertilizer to function. The main claim of this invention is its adjustable legs, which is a feature that is not found in any other such machine. All other machines have only one leg, which ejects both seeds and fertilizer, and therefore it is not possible to vary the depths at which both are applied. In this machine the fertilizer is applied deeper in the root zone of the crop as recommended by agricultural scientists, while the seeds are sowed at a slightly less depth.

The machine has three units:

1. Box
2. Cultivator

3. Arm wheel

Box:

The box has a separator in the middle, which divides the inner space into two. In the front portion fertilizer is kept and in the rear portion the seeds are kept. Both these compartments have outlet holes through which the seeds and the fertilizer come out. In front of each of these holes are rotating shafts that are controlled by the arm wheel of the cultivator. These shafts have a rubber washer attached to their ends, which pushes the seeds and fertilizer into the funnels fitted below the holes. Near the exit holes locks have been placed to keep the washer in place. By manipulating the washer, the amount of fertilizer or seeds ejected can be controlled. The noses of the funnels are connected to PVC pipes which guide the fertilizer and the seeds to the front and rear legs respectively. The outlets have a lever, which is activated when the machine is activated when the machine is touching the ground and is deactivated when the machine is lifted above the ground. In this way the sowing and fertilizing operation is automated. The farmer can also manually operate the lever. The box containing the seeds and the fertilizer has been specially designed. The same chain moves the shafts connected to both portions of the box, which is also the novelty of this machine.

The cultivator:

The cultivator has a central importance in this invention. It has been designed differently from the cultivators of other machines. In the present design, different sets of legs distribute the seeds and the fertilizer. These legs are aligned one behind the other in a line. The cultivator has at least one leg for fertilizer and one for the seeds. The minimum distance between the front and rear legs can be reduced to 10 cms and can be increased to any limit depending on the requirement of the crop. The front legs broadcast the fertilizer to the desired depth and the rear sow the seeds. The seeds can be distributed so that there is a specified distance between each set of seeds grown. The seeds are sown after covering the fertilizer broadcasted by the front legs with a layer of soil. Because of this there is a difference in the depths at which the fertilizer and the seeds are

applied. After the seeds have been sown, a plank levels the ground and covers the seeds with soil. The number of legs in the cultivator can be increased as per requirement. Bullocks as well as tractor can pull the cultivator. Separate designs are available for both.

Arm Wheel:

When the machine touches the ground, the friction with the ground forces the arm wheel to rotate and move a chain, which in turn rotates the shafts that release the fertilizer and the seeds from the box.

Brief description of the accompanying drawing

Figure 1 shows the perspective view of the of the seed sum fertilizer sowing machine in accordance with the present invention.

Detailed description of the accompanying drawing

The illustrations given in the accompanying drawing is that of a seed cum fertilizer machine. It works on the principle that seeds and fertilizer should be applied at different depths to get best results. The fertilizer should be applied to the root zone of the crop.

The machine has three parts: box, cultivator and arm wheel. The different parts of each have been illustrated as:

Box:

- 1 - Cover, used to close the box after filling it with seeds and fertilizer.
- 2 – The section of the box that holds the seeds.
- 3 – The section of the box that holds the fertilizer.
- 4 – The shaft that pushes the seeds. This has minimum of one rubber washer but more can be attached as per requirements.

- 5 - The shaft that pushes the fertilizer. This has minimum of one rubber washer but more can be attached as per requirements.
- 6 – Chain. This rotates the above shafts by communicating with the arm wheel.
- 7 - Disc washer slide. There are two sets of them. They have different sized holes and control the flow of the fertilizer and the seeds.
- 8 – Round lever leaf. This loosens and tightens the chain.
- 9 – Straight lever leaf. This is used to maintain the direction the box and chain.
- 10 – Attachment: This is used to connect the machine to the tractor.
- 11 - Box stand: This stand is connected to the cultivator frame. The box is placed on this stand.
- 12 – Straight lock rod: This locks the disc washer slides.
- 13 – Lever: This stops the flow of the seeds and the fertilizer when the machine is lifted above the ground and starts the flow when it touches the ground. The farmer can also control the flow manually by operating this lever.
- 14 – Funnel: This supplies the seeds through a PVC pipe (16) to the ground
- 15 – Funnel: This supplies the fertilizer through a PVC pipe (17) to the ground
- 16 – PVC pipe: This is connected to the above-mentioned funnel (14)
- 17 - PVC pipe: This is connected to the above-mentioned funnel (15)

Cultivator

- 18 – Box tines: The front tines fitted to the frame of the cultivator are lifted using this (at least one)
- 19 – Pipe: This is connected to the PVC pipe 17 and broadcasts the fertilizer to the required depth (at least one).
- 20 – Tines: This is the front tine, which is thicker than the rear tine (at least one)
- 21 – Collar: To broadcast the fertilizer at the required depth, this holds back the soil till the fertilizer is deposited (at least one)
- 22 – Spade: This performs the above function for the front tine (at least one)
- 23 – Leveler: This spreads soil over the seeds after they are sown (can be replaced by a plank)

24 – Angle: These are fitted to the frame of the cultivator and the tines are connected to them to keep them in alignment (at least one)

25 – Frame channel: The fixed chassis is made of this

26 – Cultivator frame: This is the main body of the cultivator. Also called chassis

27 – Box tines: This connects the rear tine, which releases the seeds to the frame (at least one)

28 – Tines: This is the tine that releases the seeds and is connected to the cultivator frame (at least one)

29 – Pipe: This is connected to the PVC pipe 16 that releases the seeds and maintains the appropriate separation between the fertilizer layer and the seed layer.

30 – Plough: This is connected to the tine that sows the seeds. It spreads the soil after the seeds have been sown (at least one)

31 – Stopper: This is connected to the tine that sows the seeds. It holds back the soil till the seeds are sown (at least one)

Arm wheel

32 – Double gear: This has a large and small gear, which is moved by the shafts rotated by the arm wheel. These control the speed at which the shafts rotate.

33 – Small chain: This operates the larger gear through the smaller gear.

34 – Arm wheel gear: This is fitted to the shaft of the arm wheel and rotates with the arm wheel.

35 – Bearing box: This contains two bearings to which the arm wheel is fitted.

36 – Arm wheel plate: This is a circular disc with the serrated edges, which rotates as it is pushed across the ground.

37 – Wheel plate leaf: This is fitted to the arm wheel plate as shown in the illustration. It projects longitudinally from the wheel plate. As the arm wheel is pulled across the ground, it causes the wheel to rotate.

Accordingly there is provided a seed cum fertilizer sowing machine comprising a box, a cultivator and an armature wheel;

said box defining a section 2 for holding seeds and section 3 for holding fertilizer; said section 2 having a shaft 4 and said section 3 having a shaft 5, both the shaft being driven by a chain 6 which is in communication with the said armature wheel as herein described; said box having a plurality of disc washer slide 7 bearing different sized holes for controlling the flow of the fertilizer & seeds and locked through a straight lock rod 12; said box having a lever 13 attached to it to start or stop the flow of the fertilizer & seeds; said box being in communication with a funnel 14 for supplying seeds to the ground through a pipe 16 & with a funnel 15 for supplying the fertilizer to the ground through a pipe 17; said box being connected to the cultivator through a stand 11 and cultivator frame 26;

said cultivator having a leveler 23, box tines 18 & 27, a plurality of front tines 20 and a plurality of rear tines 28 connected to the cultivator frame 26; said each front tine being attached with a spade 22, a collar 21 and a pipe 19; said each rear tine being attached with a plough 30, a stopper 31 and a pipe 29;

wherein the distance between said front and rear tines is adjustable and is atleast 10 cms.