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(56) Documents cited
**GB A 2107563 GB 1250669
GB A 2078481 GB 1197626**

(58) Field of search
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A1F**

(54) **Seed drilling machine**

(57) A machine is provided having at least one set of spring tines mounted on a foldable sub-frame so as to be lifted out of normal position into a reduced width position. The feed of the seeds in such an arrangement is pneumatic so that the seeds may be fed and distributed from a hopper of limited width, from which they are preferably extracted by means of fluted roller extending longitudinally of the machine. The tines may also be lifted out of grounding engaging position, and this movement is arranged to interrupt drive to the seed distribution device.

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SPECIFICATION

Seed drilling machine

5 This invention relates to seed drilling machines.

In U.K. patent specification number 1197626 there is described a form of seed drilling machine in which seed is fed by gravity from a dispensing device down feed tubes to the region of the lower ends of spring
10 tines so that the seed is accurately placed in cultivated soil. The dispensing device is a fluted roller driven at a speed related to land speed by means of a ground wheel and reduction gearing. The reduction gearing may be adjustable to enable the
15 seed dispensing ratio to be varied relative to land speed. The seed is carried in a long laterally extending seed reservoir and the fluted roller also extends laterally. This machine has been commercially successful, but is limited to comparatively
20 small widths (eg. up to 3 or 4 metres). It is also normally a semi-mounted implement so that the tines can be lifted clear of the ground for transport and turning at the end of a row.

In accordance with the present invention there is
25 provided a seed drilling machine comprising a laterally extending series of ground-disturbing spring tines, a flexible seed tube associated with each spring tine and terminating adjacent to the distal end of the tine, means for causing a current of
30 air to pass along each seed tube to convey seed from a feed point to the distal end of the tine, and a dispensing device driven at a speed related to ground-speed to dispense seed from a hopper to the feed points of the seed tubes, in which a proportion
35 of the spring tines are mounted on frame elements pivotally mounted relative to a support for a further proportion of the tines so as to be foldable to a retracted position for transport to reduce the width of the machine.

40 By providing the width reduction facility, it is possible for the machine, which is normally in the form of a trailed implement to be towed behind a tractor, to be manoeuvred through farm gates of normal width, and also taken along public roads.
45 With an implement overall width of six metres, this would not be possible without some form of width reduction. Also, with the onset of bulk supplies of seed in one tonne or greater lots, it is advantageous for the machine to have a central hopper large
50 enough to take such a quantity of seed. With the old style of reservoir extending across the machine, the feeding of seed into this comparatively small dimensioned but long reservoir will be much more difficult. In addition, it would provide a barrier to ready
55 folding of the machine. With a hopper arrangement, the feed device would normally extend longitudinally of the machine, and could be a fluted roller extending longitudinally, rather than transversely. With pneumatic feed of the seed, the seed tubes may
60 be of extended length since they do not rely on gravity to maintain the movement of the seed through the seed tubes.

The fluted roller may have helical flutes and these may cooperate with an edge which is angled to be
65 substantially parallel with the flutes so as to provide

regular distribution of seed over the said edge.

The fluted roller, or other dispensing device is normally driven from a ground engaging wheel so as to operate at a speed related to ground-speed,
70 to maintain the correct distribution of seed regardless of progress over the ground, and it is preferred that the drive should be through a steplessly variable speed change mechanism, normally a reduction mechanism, to enable the user to have accurate
75 control of the rate of seed dispensing.

In a preferred embodiment of the machine, it is in the form of a trailed implement to be towed behind a tractor, and the power take-off of the tractor would be used to drive a fan for the pneumatic feed for the
80 seed. The fan would blow air into the seed tubes through venturis, and the seed from the dispenser would be fed into the tubes at the venturis so as to be entrained in the air flow.

The machine itself would comprise a frame
85 mounted in ground engaging wheels, and the spring tines would be mounted on a sub-frame adapted for strictly vertical raising and lowering in relation to the machine frame under hydraulic power provided from the tractor. This would enable the tines to be
90 moved in and out of ground engagement. Further, the sub-frame would have foldable end portions, each carrying a proportion of the tines so that these could be folded up to reduce the overall width of the implement for transport. This again will be
95 achieved using hydraulic rams powered from the tractor hydraulic system. The sub-frame would preferably also carry a series of coulters for cultivating immediately prior to drilling by means of the spring tines. The seed tubes would have flexible end
100 portions so as to accommodate movement of the spring tines to the distal ends to which their discharge ends are attached. Then remainder of the seed tubes could be generally rigid and could include flexible elbow portions where hinging is
105 required.

The machine frame would also carry a seed hopper which would have a fluted roller forming a discharge device at the bottom thereof. This roller would be driven from a ground wheel through a
110 steplessly variable speed reduction device, and there is also a mechanism for interrupting the drive train when the sub-frame is lifted to move the spring tines out of ground engaging position. This would interrupt the drive to the fluted roller and thus the
115 dispensing of seed.

It is also preferred that the flutes on the fluted rollers should be generally helical to cooperate with a plate having its working edge angled so as to be generally parallel with the helical flutes.

120 Provision may also be made for stopping off access to parts of the fluted roller, or for disconnecting the drive to parts of the fluted roller, so that certain seed tubes or groups of them may be deprived of seed feed. This enables the machine to
125 be used over a small width if required.

Various modifications may be made within the scope of the invention.

CLAIMS

1. A seed drilling machine comprising a laterally extending series of ground-disturbing spring tines, a
5 flexible seed tube associated with each spring tine and terminating adjacent the distal end of the tine, means for causing a current of air to pass along each seed tube to convey seed from the feed point to the distal end of the tine, and a dispensing device driven
10 at a ground-speed related speed to dispense seed from a hopper to the feed points of the seed tubes, in which a proportion of the spring tines are mounted on frame elements pivotally mounted relative to a support for a further proportion of the tines so as to
15 be foldable to a retracted position for transport to reduce the width of the machine.
2. A seed drilling machine as claimed in claim 1, in which the spring tines are all mounted on a machine frame for conjoint raising and lowering
20 relative to the machine frame between operative and inoperative positions.
3. A seed drilling machine as claimed in claim 1 or 2, in which the dispensing device is a fluted roller running longitudinally of the machine.
- 25 4. A seed drilling machine as claimed in claim 3, in which the fluted roller has helical flutes cooperating with an angled edge of a plate to feed seed over the said edge.
5. A seed drilling machine as claimed in claim 1,
30 2, 3 or 4, in which the dispensing device is driven from a ground wheel through a steplessly variable speed change device.