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Hand Pushed Precision Fertilizer Dispenser

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Hand Pushed Precision Fertilizer Dispenser

A fertilizer dispensing tool, suitable for precision application of granular fertilizers on experimental plots is described. A suitable hand pushed cart design has been located and suggestions for mounting an Øyjord Dispensing System are given. The Øyjord dispensing system is recommended as it is readily available, is easy to load with pre-measured samples and is self cleaning. Accessories are also available for bulk application at different rates.

Vehicle

A European designed hand pushed dispenser was seen in operation and is of ideal size and weight. An outline drawing of the cart is given in Figure 1 complete with measurements necessary to mount the Øyjord system. The cart can be made of 1/16" wall, 1" outside diameter steel welded tubing and a pair of bicycle wheels. Two mounting bars made of $1\frac{1}{2}$ x $1\frac{1}{2}$ x 14 gauge square steel tubing 18" long are required to mount the Øyjord system.

Dispensing Equipment

The following Øyjord parts are required from the manufacturer:
Jens A. Shou, Møk Verksted, 1440 Drøbak, Norway.

- 1 only Large Øyjord cone feeder complete with bevel gears 2:1 mounted on a standard mounting frame with distributor. 12 volt electric powered.

1 only Combination one-way clutch and start-stop clutch with cone drive shaft.

1 only Distributer head (state number of outlets required).

1 only Lien funnel

1 set of (number to correspond with distributer head)

Telescopic plastic seed tubes complete with vinyl attachment socks

For dispensing a uniform blend of fertilizer at various rates without pre-measuring, a bulk hopper can be used (see Report 7233-3, Engineering Research Service, Agriculture Canada, Ottawa).

1 only Øyjord fluted feeder

Drives

Two drives are required for the dispensing apparatus. One must come from a wheel to drive the cone dispenser. Information on calculating ratios is given in Report 7233-1, Engineering Research Service, Agriculture Canada, Ottawa. The gear set normally supplied with Øyjord equipment is 2:1. For this application bicycle sprockets and #48 ASA chain is sufficient to drive the cone. A one-way clutch to prevent the cone from reversing is required.

It is also ideal to have a clutch to disengage the drive in transport. The drive must be geared so that the cone will turn one complete turn in the length of the plot plus 1 meter.

A second drive is required for the distributor and in this case must be an electric motor supplied by the dispensing equipment distributor. A battery must be carried on the cart.

Application Elements

Fertilizer may be applied in rows or bands by securing short lengths of $1\frac{1}{2}$ " dia. tubing at the desired intervals on an attachment bar. If an even covering of fertilizer is required, a baffle spout must be used to spread the fertilizer. Baffles from commercial planter herbicide applicators are suitable for most fertilizers; or the flow of fertilizer can be directed onto an inverted conical funnel so that even spreading is achieved.

Distributors are available with any number of outlets up to 14 but excluding 13. Thus, a distributor housing with the desired number of rows to suit the plot must be ordered. Distributer heads are easily changed if different band spacing is desired. Seed tubes should be ordered for each distributor if more than one is required.

Details

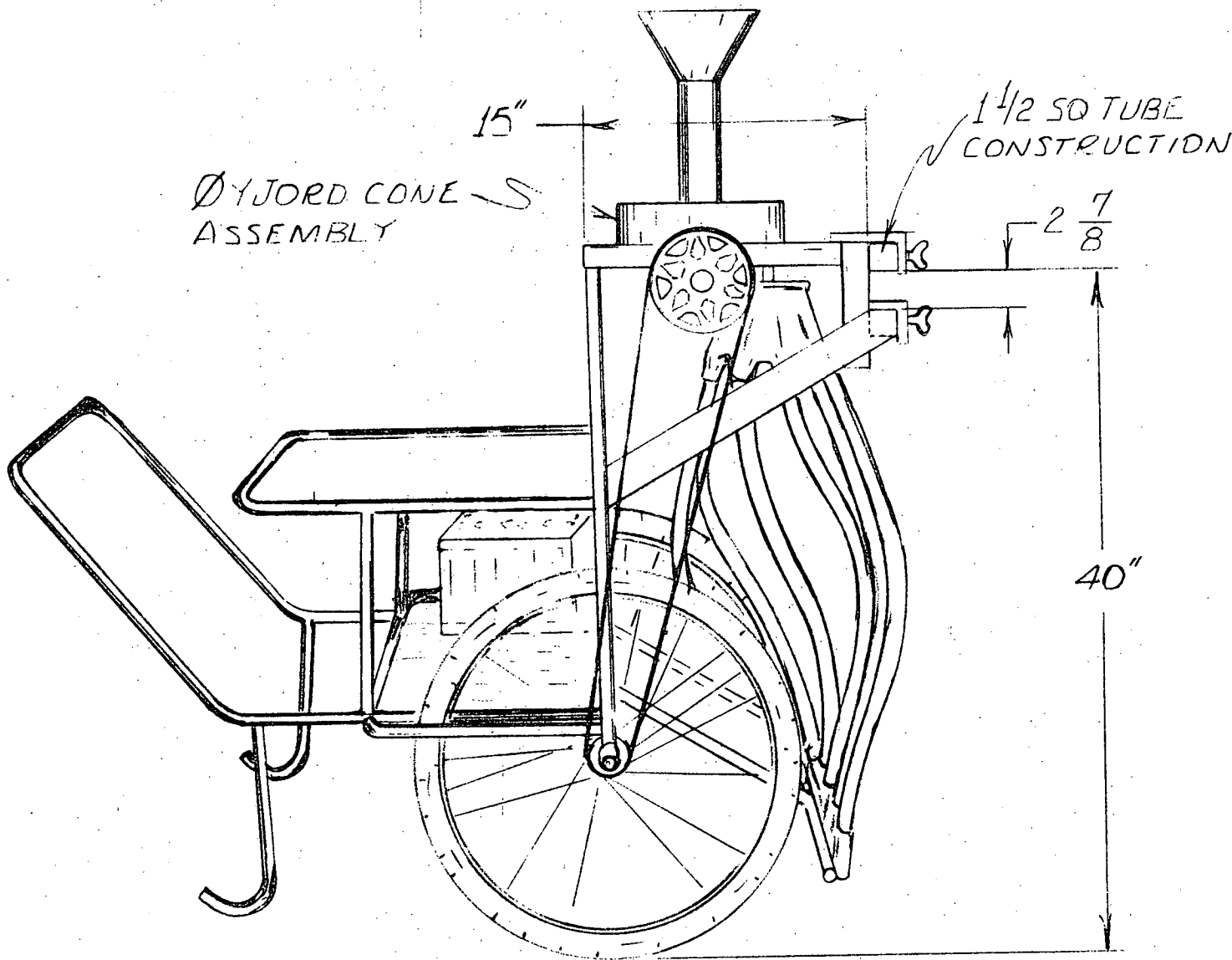
The capacity of the cone dispenser is .3 litres or 500 grams of 0-15-30 fertilizer. A smaller cone is available with $\frac{3}{5}$ of the capacity. Higher rates can be applied by multiple passes over the plot.

When using the Lien Funnel, a certain amount of fertilizer is lost out of ~~the~~ discharge hole of the cone. This amount should be estimated for each rate and added to the pre-measured samples.

A uniform forward speed is required to discharge a linear accurate spread because of the time lag in travel of the fertilizer through the distributor and tubes. A tachometer mounted on a wheel will assist in maintaining an accurate speed.

The cart must be pushed a certain distance, probably $2/3$ to 1 metre before fertilizer will emerge from the tubes. Care must be taken to see that sufficient pathway pre-run is made. It is also good practice to allow $\frac{1}{2}$ metre fertilizer spread at each end of the plot to allow for inaccuracies in start and finish point.

G.B. Hergert
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Fig. 1. Hand Pushed Precision Fertilizer Distributer.

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