June 19, 1945. A. JOHNSTON ET AL 2,378,484

WOOL SAMPLER

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Fig. 1.

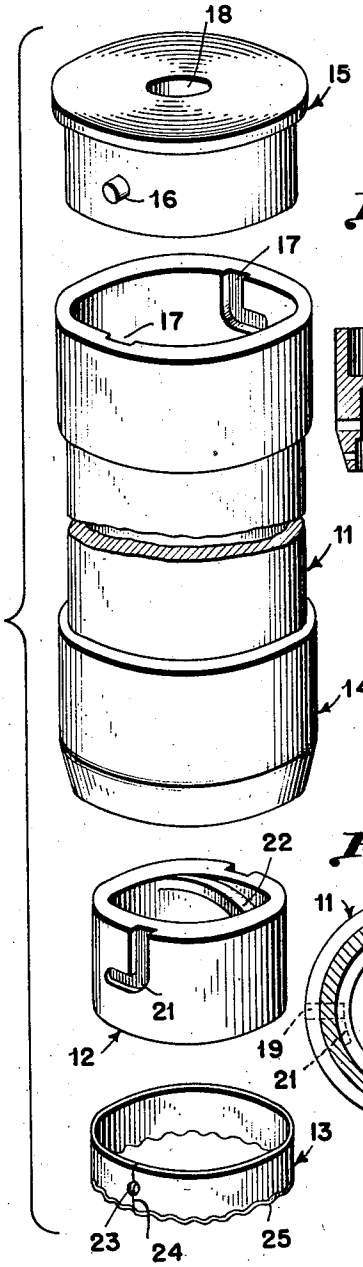


Fig. 3.

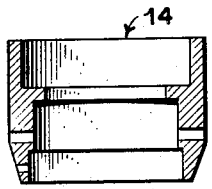


Fig. 2.

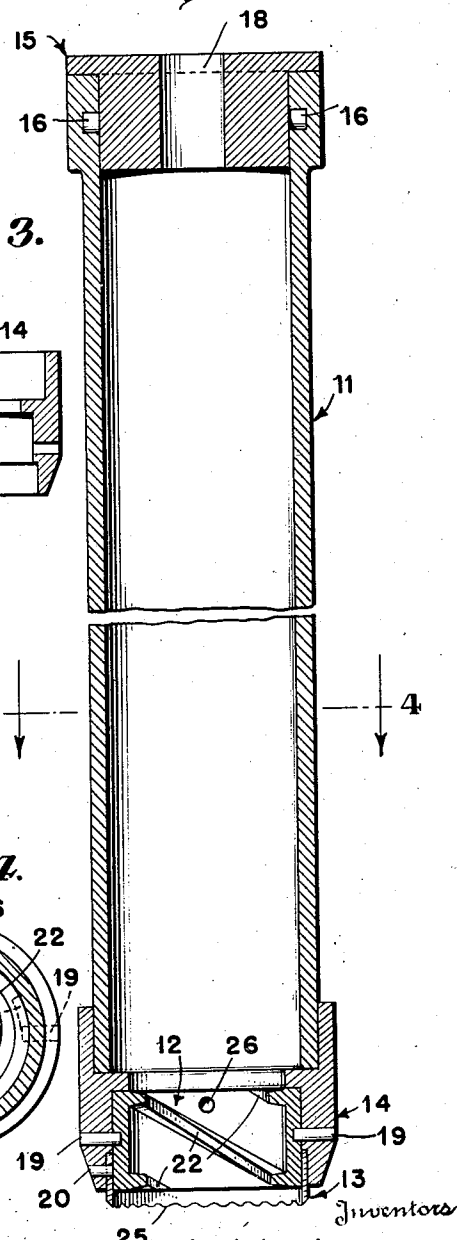


Fig. 4.

Inventors
A. Johnston
G. C. LeCompte
H. N. Foss
William Bier
Attorneys

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WOOL SAMPLER

Alexander Johnston and George C. Le Compte, Arlington, Va., assignors to the United States of America as represented by the Secretary of Agriculture

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3 Claims. (Cl. 73—425)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

This application is made under the act of March 3, 1883, as amended by the act of April 30, 1928, and the invention herein described, if patented, may be manufactured and used by or for the Government of the United States of America for governmental purposes without the payment to us of any royalty thereon.

This invention relates to wool sampling, and particularly to devices for cutting out a sample of wool known as a core, from loosely bagged wool.

Wool sampling devices of the prior art, when employed on loosely bagged wool, are deficient in certain respects. Often, after many insertions of the sampler into the wool being sampled, no core is obtained due to insufficient resistance of the wool, the sampler by-passing the wool in its path instead of cutting through it. Also, when cores are obtained, there is a tendency for the wool to rope and twist within the sampler with the result that the sampler becomes jammed and will not press further into the wool, because the roping and twisting tends to prevent the entrance of more wool into the sampler. This deficiency of prior devices is due to the fact that their internal diameters are not variable at any point and no provision is made to force the core deep into the sampler or to prevent the core from being pulled out again when the sampler is withdrawn from the wool. These and other deficiencies of devices of the prior art result in samples that are not truly representative of the wool bulk.

This invention has for its object the provision of a wool sampler which will obviate the deficiencies mentioned above and render wool sampling much easier, more expeditious, accurate, and economical.

According to this invention a wool sampler is provided which comprises a circular tube having a circular cutter at the forward end of the tube and having a rigid, radially inwardly projecting spiral ridge fixed on the interior surface of the tube adjacent to the cutter, whereby as the wool sampler is rotated and pressed into a mass of wool, the cutter will cut out a core of wool, and the spiral ridge will propel the core into the tube.

The spiral ridge, which is located adjacent to and behind the cutter, serves many functions. It helps to pull the wool away from the cutting edge of the cutter as the wool is cut and forces it down the body of the tube. By its action, it aids the cutter by preventing the wool from becoming entwined around the cutter. Furthermore, it propels the core into the body of the tube and thus prevents the core from being pulled out when the sampler is withdrawn from the bag of wool being sampled.

The cutter is preferably of a larger internal diameter than the portion of the tube remote from the rearward end and containing the spiral ridge but of smaller internal diameter than the remaining rear portion of the tube. This arrangement causes a constriction in the forward end of the tube which, when supplemented by the action of the spiral ridge, serves to prevent the wool from roping or twisting, and when the core is propelled into the remaining portion of the tube, it expands because of the increased internal diameter, thus resisting any tendency to be pulled back out when the sampler is being withdrawn from the wool.

In the accompanying drawing, which illustrates an embodiment of the invention,

Figure 1 is an exploded elevational view of the wool sampler,

Figure 2 is a longitudinal section of the wool sampler in its assembled form,

Figure 3 is a longitudinal section of the coupler alone, and

Figure 4 is a section on the line 4—4 of Figure 2.

Referring more particularly to the drawing, the wool sampler, preferably of a circular, cylindrical, tubular shape, has a smooth exterior surface and a smooth interior surface, and comprises a tube 11, a throat 12, and a cutter 13.

Tube 11 has a rigidly attached coupler 14 at its forward end and a conventional chuck 15 at its rear end, the latter being inwardly disposed in tube 11 and attached thereto by means of chuck-pins 16, one of which is shown in Figure 1, the other lying diametrically opposite. The chuck-pins are mounted on the exterior surface of chuck 15 and engage conventional bayonet tube slots 17 located within the interior surface of the rear end of tube 11. The chuck 15 provides a tapered bore 18 for mounting a power mechanism, not shown, to rotate the sampler.

The coupler 14 is rigidly attached to tube 11 and mounts throat pins 19 and cutter pin 20 on its interior surface, said throat pins 19 engaging the conventional bayonet throat slots 21 located on the exterior surface of throat 12, thus attaching the throat 12 to tube 11, while said cutter pin 20 attaches the cutter 13 to the coupler 14.

The throat 12 is of smaller internal diameter than both the cutter 13 and the tube 11, is separately attached to tube 11, and when properly positioned in the sampler, lies just beyond the forward end of tube 11 in alignment therewith and within a portion of the space surrounded by coupler 14. The throat 12 has a rigid, radially in-

wardly projecting spiral ridge 22 fixed on its interior surface which extends the full circumference of the throat 12.

The cutter 13 is a split ring formed of spring steel, having an aperture 23 in its circumference which is bisected by the split 24. The cutter 13 is of larger internal diameter than the throat 12 but of smaller internal diameter than tube 11, is positioned at the extreme forward end of the sampler between the forward exterior surface of throat 12 and the forward interior surface of coupler 14, and has its cutting edge 25 extending beyond the forward ends of the throat 12 and coupler 14. As mentioned before, the cutter 13 is separately attached to coupler 14 by means of cutter pin 20. When placed into position, the split ends of the cutter 13 are made to overlap and the cutter 13 then inserted, before the throat 12 is positioned, into the space it is to occupy. The split cutter 13 is then opened to place the halves of the aperture 23 about cutter pin 20, and then released so that cutter 13 becomes firmly attached to coupler 14 through cutter pin 20. Throat 12 is then inserted through the hollow center of the cutter 13, into its proper position.

Keyholes 26, one of which is shown in Figure 2, the other lying diametrically opposite, are located in the interior surface of throat 12 and are the means for receiving a convenient tool, such as a T-shaped key, for engaging the keyholes 26 and manually rotating throat 12 to engage or disengage, as desired, throat slots 21 and throat pins 19, thus securely attaching or detaching the throat 12 and tube 11.

In assembling the sampler, the cutter is first attached to the coupler 14 by means of aperture 23 engaging cutter pin 20. The throat 12 is then inserted within a portion of the space surrounded by coupler 14 and the convenient tool then similarly inserted within throat 12 so as to engage keyholes 26. This key is then rotated until throat slots 21 engage throat pins 19 and thus secure throat 12 to tube 11. Chuck 15 is attached to tube 11 by means of tube slots 17 engaging chuck-pins 16 and a power mechanism, such as an electric drill, not shown, is mounted on chuck 15 by means of tapered bore 18. The power mechanism is then actuated to rotate the sampler.

In operation, the cutting edge 25 of cutter 13 is pressed against the bag of wool being sampled. As the cutting edge 25 rotates, it cuts the wool fibres which form a core. This core is then retracted into throat 12 as it is cut and forced down into the body of tube 11 by spiral ridge 22.

Having thus described our invention, what is claimed is:

1. A wool sampler comprising a circular tube having a circular cutter at the forward end of the tube and having a rigid, radially inwardly projecting spiral ridge fixed on the interior surface of the tube adjacent to the cutter for propelling a core of wool into the rearward portion of the tube as the tube is rotated to cut the core, the internal diameter of said cutter being larger than the internal diameter of the tube surrounding said spiral ridge but smaller than the internal diameter of the remaining rear portion of the tube.

2. A wool sampler comprising a circular tube, a circular throat, and a circular cutter, said tube having a coupler attached to its forward end; said throat being of smaller internal diameter than the tube, being located beyond the forward end of the tube in alignment therewith, being attached to the tube by means of said coupler, and having a rigid, radially inwardly projecting spiral ridge fixed on its interior surface for propelling a core of wool into the rearward portion of the tube as the tube is rotated to cut the core; said cutter being of smaller internal diameter than the tube but of larger internal diameter than the throat, being located between the coupler and the throat, and having its cutting edge extending beyond the forward ends of the throat and coupler.

3. A wool sampler comprising a circular tube having a circular cutter at its forward end, having a portion remote from the rearward end adjacent to the cutter, said portion being of smaller internal diameter than that portion rearwardly thereof, and having a rigid, radially inwardly projecting spiral ridge fixed on the interior surface of that portion of the tube having the smaller internal diameter for propelling a core of wool into the rearward portion of the tube as the tube is rotated to cut the core.

ALEXANDER JOHNSTON.
GEORGE C. LE COMPTE.