

Sept. 19, 1961

C. R. MCKINNEY ET AL

3,000,217

SAMPLE SPLITTER

Filed Jan. 16, 1956

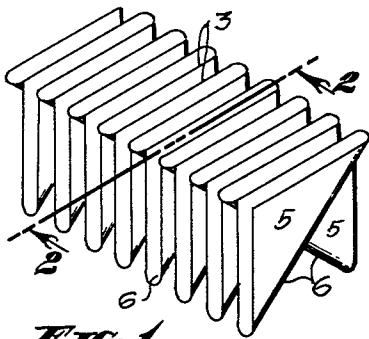


FIG. 1

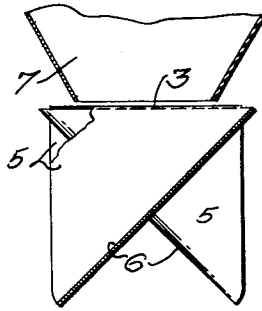


FIG. 2

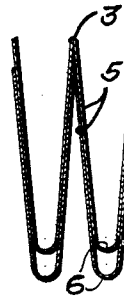


FIG. 7

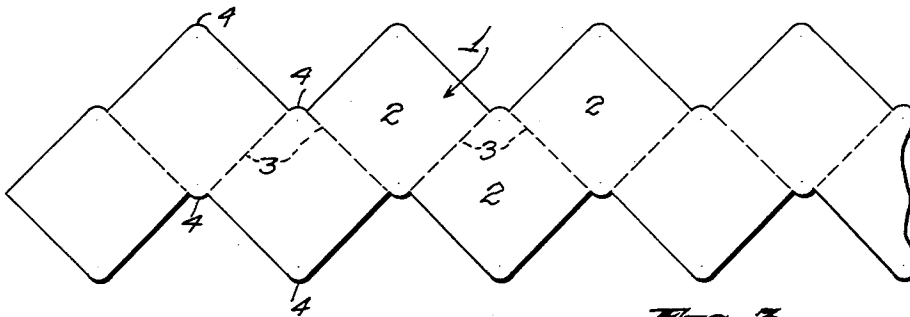


FIG. 3

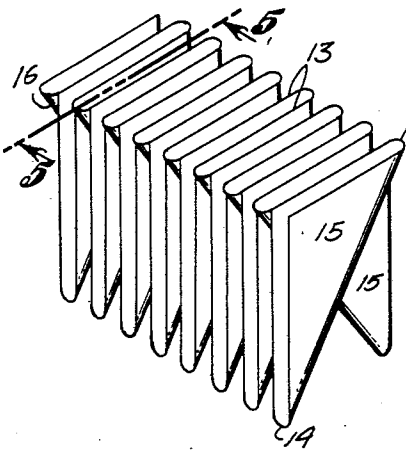


FIG. 4

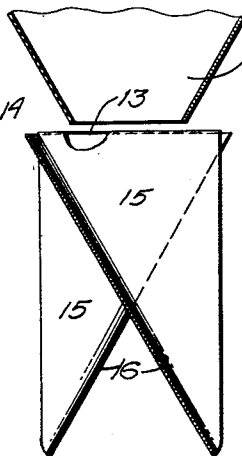


FIG. 5

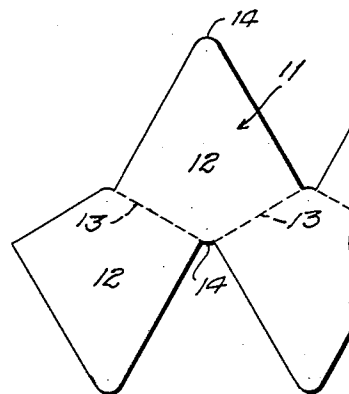


FIG. 6

CHARLES R. MCKINNEY
LEON T. SILVER
INVENTORS

BY

Lyons & Lyons
ATTORNEYS

1

3,000,217

SAMPLE SPLITTER

Charles R. McKinney, Monrovia, and Leon T. Silver, Altadena, Calif., assignors to California Institute Research Foundation, Pasadena, Calif., a corporation of California

Filed Jan. 16, 1956, Ser. No. 559,188
4 Claims. (Cl. 73-421)

Our invention relates to sample splitters; that is, to devices for separating granular or mobile substances for the purpose of obtaining a representative sample. Included in the objects of this invention are:

First, to provide a sample splitter having a series of succeeding chutes sloping in opposite directions so that a mobile substance is divided into two quantities discharged in opposite directions, and further divided into smaller quantities discharged from each chute.

Second, to provide a sample splitter which is formed from a single piece of material folded in such a manner as to provide oppositely sloping chutes without cracks or joints to entrap material.

Third, to provide a sample splitter which may be formed of expendable material such as paper so that it may be used once and discarded, and is therefore particularly suitable for contaminable material.

Fourth, to provide a sample splitter which is inherently strong and capable of self-support even when formed of expendable material.

Fifth, to provide a sample splitter which may be arranged so that a stack of the sample splitters may be nested or so that the sample splitter may comprise a permanent base of metal and receive a disposable liner.

With the above and other objects in view as may appear hereinafter, reference is directed to the accompanying drawings in which:

FIGURE 1 is a substantially, diagrammatic view showing one form of the sample splitter.

FIGURE 2 is a sectional view thereof through 2-2 of FIGURE 1.

FIGURE 3 is a developed view of the sample splitter showing the sheet blank from which the sample splitter is made.

FIGURE 4 is a perspective view similar to FIGURE 1 showing a modified form of sample splitter.

FIGURE 5 is a transverse, sectional view through 5-5 of FIGURE 4.

FIGURE 6 is a developed view showing the sheet blank from which the modified sample splitter is formed.

FIGURE 7 is a fragmentary, longitudinal, sectional view showing the manner of construction of the sample splitter to permit nesting.

Reference is first directed to FIGURES 1, 2, and 3.

The sample splitter is formed from a single sheet of material. The material may be metal, plastic or paper or other suitable sheet material capable of being folded. The blank designated 1 comprises a series of square sections 2. Two adjacent edges of each section are connected by fold lines 3 to corresponding edges of adjacent sections. The corner of each section between the fold lines 3 is rounded as indicated by 4 and the diagonal corner is likewise rounded. Each section is adapted to be folded diagonally between the rounded corners 4 so as to form a trough or chute having triangular walls 5 and a rounded inclined bottom 6. In the construction shown in FIGURES 1, 2, 3 utilizing square sections, the rounded bottoms of the chutes are disposed at a 45° angle. The fold lines 3 constitute the upper edges of the triangular side-walls 5.

By reason of the manner in which the square sections

2

are connected adjacent troughs or chutes incline in opposite directions. The blank 1 is formed of relatively thin gage material, so that the wall thickness separating the troughs or chutes is relatively small compared with the width of each chute. As many chutes are provided as desired for a given length of sample splitter.

In a construction illustrated in FIGURE 1, sixteen chutes are provided, eight sloping in one direction and eight sloping in the opposite direction. The sample splitter is placed under a suitable hopper 7 to receive granular material or other mobile substance which is to be sampled. The material discharged from the hopper is divided substantially equally by the two sets of chutes. By arranging a cascading series of chutes or by repeating the sample splitting operation, a relatively small sample may be obtained from a large quantity of material with reasonable assurance that the sample will be representative of the entire quantity of the material.

The simpler construction shown in FIGURES 1, 2, 3 passes most kinds of material with a minimum of retention. However, it is possible to construct the sample splitter so as to provide troughs or chutes having a steeper angle. Such a construction is shown in FIGURES 4, 5, and 6.

In this construction a blank 11 is provided which is formed of a series of polygonal sections 12. Each section has four sides, comprising two adjacent short sides and two adjacent long sides. The short sides of each section 12 are joined by fold lines 13 to the short sides of adjacent sections in the manner of the first described structure.

The diagonal corners designated 14 between the short sides and between the long sides respectively are rounded. Each section is folded to form a trough 13, having triangular walls 15 and rounded bottom 16. By proper selection of the relative lengths of the sides of the polygonal sections 12, the rounded bottoms of the chutes or troughs 13 formed may be disposed at a 60° angle to the horizontal or any other desired angle.

The fold lines 3 or 13 may be crease folds so that the side walls 5 and 15 lie tight against each other or the side walls 5 or 15 may be spread slightly as indicated in FIGURE 7 so that a series of sample splitters may be stacked or nested together. This is particularly desirable if the sample splitter is formed of paper or other expendable material and is needed in large quantity. This is also desirable if an expendable liner is placed inside a metal base.

Having thus described certain embodiments and applications of our invention, we do not desire to be limited thereto, but intend to claim all novelty inherent in the appended claims.

We claim:

1. A blank destined to become a sample splitter, comprising: a single piece of stock defining a series of similar four sided figures, first fold lines adjoining two adjacent sides of each figure to a pair of adjacent figures, each figure also adapted to be folded along a diagonal axis to form a trough having triangular sides substantially parallel sides, suspended between neighboring troughs along said first fold lines.

2. A sample splitter blank as set forth in claim 1 wherein: each of said figures is approximately square.

3. A sample splitter blank as set forth in claim 1 wherein: each of said figures having two short sides defined by said first fold lines and two long sides, and said diagonal axis fold extends from a corner between said short sides to the corner between said long sides.

4. A blank destined to form a sample splitter comprising

ing: a single sheet of material defining a zig-zag fold line, a series of oppositely directed tabs between said zig-zag fold lines, and other fold lines extending transversely from each apex of said zig-zag fold lines, said sheet being foldable along said zig-zag fold line and said transverse fold line to form a series of troughs foldably connected to adjacent troughs. 5

References Cited in the file of this patent
UNITED STATES PATENTS

280,994	Andrus	July 10, 1883
1,133,933	Colby	Mar. 30, 1915
2,470,966	Abbott et al.	May 24, 1949
2,496,626	Jackson	Feb. 7, 1950
2,670,629	Belden	Mar. 2, 1954