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S. C. SWANBERG ET AL

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CONTAMINATION SAMPLER

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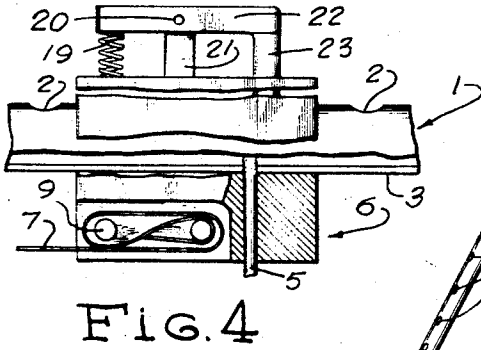


FIG. 4

FIG. 1

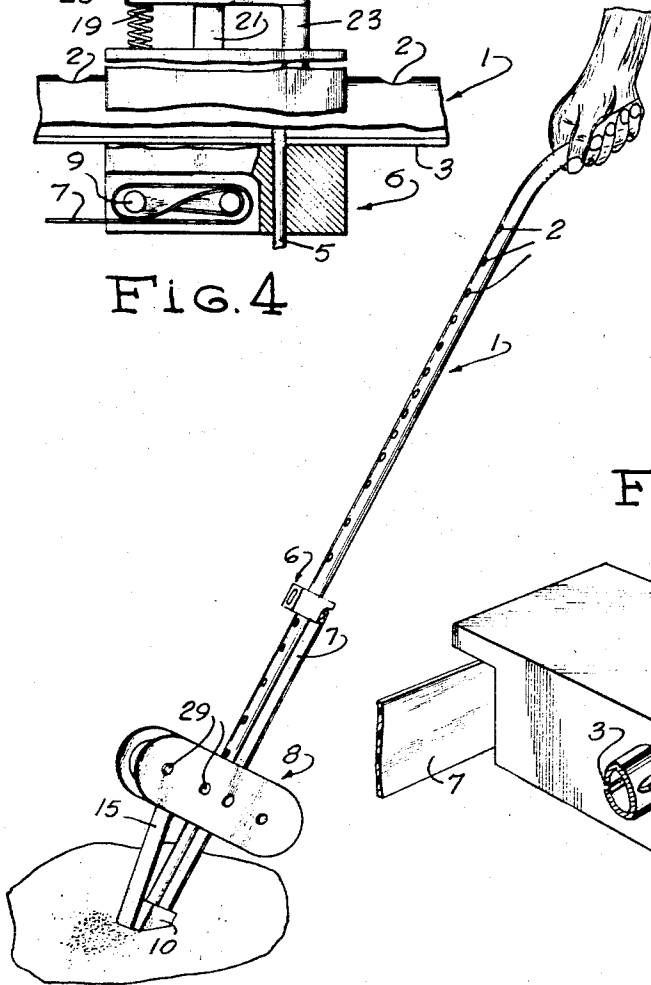


FIG. 3

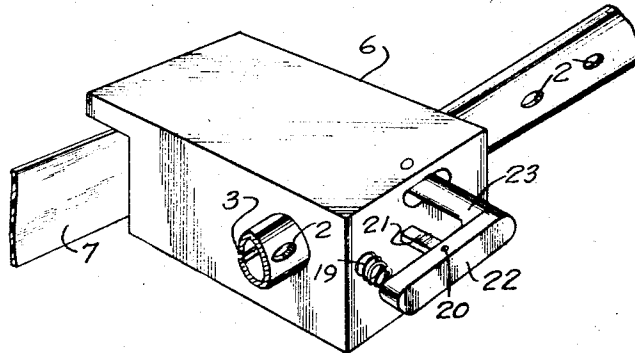
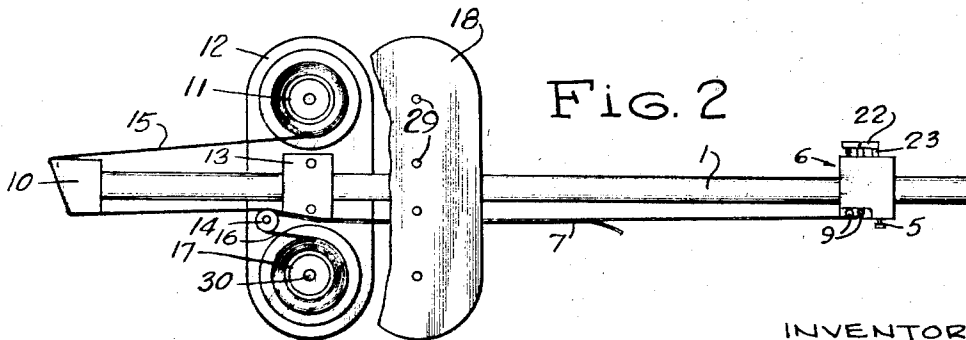


FIG. 2



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CONTAMINATION SAMPLER

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2 Claims

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ABSTRACT OF THE DISCLOSURE

The contamination sampler disclosed in this application provides a convenient means for checking the radiation level of physical facilities in which radiation contamination is a constant threat. The sampler provides an efficient means by which "swipe" samplings; that is, rubbing an absorbent material over a surface, are taken and preserved for future analysis.

The invention described herein may be manufactured and used by or for the Government for governmental purposes without the payment to us of any royalty thereon.

Background of the invention

The disclosed device concerns itself with a means by which radiation levels may be ascertained. In particular, the disclosed contamination sampler provides a means by which absorbent paper is brought into contact with surfaces, such as floors, walls, etc., which are suspected contaminated areas.

The method known in the prior art for the taking of "swipes" to determine radiation levels of possible contaminated areas is as follows. Individual pieces of absorbent paper were taken by an attendant, physically rubbed against the suspected area, and then placed within an envelope to prevent spoilage of the sample. Under the above method, the attendant is required to wear protective gloves, physically bend or reach to sample the desired areas, and physically separate the samples taken to prevent spoilage of the sample. When a large area needs to be sampled for contamination, the above prior art method is inefficient, time consuming, and physically exhausting.

Summary

It is an object of this invention to provide an efficient and accurate means by which radiation contamination may be detected.

It is a further object of this invention to provide means by which the radiation contamination samples are preserved from pollution after the samples have been taken.

The above objects are achieved by a device which permits the attendant to stand but yet sample surfaces such as floors or walls. By having the contamination sampler consist of a pole to which is attached a roll of sample paper, means for advancing the paper over the end of the pole, and an arrangement by which the swipe samples are protected from pollution, the above stated objects are achieved.

Description of the drawings

FIG. 1 is an overall view of the preferred embodiment of the contamination sampler.

FIG. 2 is a side view of the contamination sampler of FIG. 1 with one of the tape cover plates removed.

FIG. 3 is an enlarged view of the positioning carriage with the accompanying lock lever assembly.

FIG. 4 is a partial section of the positioning carriage exposing the carriage alignment slot and alignment pin.

Description of the preferred embodiment

In FIG. 1, the basic design of the preferred embodiment of the contamination sampler is represented. Number 1 represents an elongated structural support member which, in this embodiment, is a hollow tube. The upper portion of the tube is bent at a 30 degree angle to provide a handle. Positioning holes, reference numeral 2, are drilled on center of tube 1. The holes are used as positioning means for locking in place positioning carriage 6. Spool deck 8 is attached at right angles to tube 1 and provides the means by which the absorbent tape and the protective tape are carried by the sampler. Foot 10 is attached at the end of tube 1 and provides a resilient flattened surface over which absorbent tape 15 passes. The plane of foot 10 which comes into contact with the surface being sampled is at a 30 degree angle from the vertical. Thus, the sampler can be used much like most floor appliances, that is pushed at a tilt, and still have the most efficient contact between the absorbent tape and the sampled surface. Reference numeral 7 represents tape 15 after having been smudged and after having protective tape 16 applied as a protective covering.

FIG. 2 is a side view of the contamination sampler of FIG. 1 with one of the tape cover plates removed. As can be seen, absorbent tape 15 fits onto spool dowel 11, and protective tape 16 fits onto spool dowel 17. The spool dowels are in turn fastened to spool plate cover 12. Spool plate cover 12 is in turn fastened to mounting block 13 which is affixed to tube 1. Spool plate cover 18 is detachable from spool deck 8 by sliding prongs 29 out of their respective recesses 30. Thus, the refilling of the spool deck with tape can be accomplished.

Alignment roller 14 is a cylinder attached to spool cover 12 and positioned adjacent to mounting block 13 and cooperates with mounting block 13 in such a manner that as both tape 15 and tape 16 pass over alignment roller 14 and along the lower edges of mounting block 13, the tapes have pressure applied to them such that adhesive tape 16 masks absorbent tape 15. When positioning carriage 6 reaches the last positioning hole, that is the positioning hole nearest the portion of tube 1 which is bent to form a handle, the tapes have been drawn out to their limits. To obtain additional "swipes," the tapes are torn off at a convenient place down near spool deck 8, the "swipes" removed for analysis, and the free ends of tapes 15 and 16 are pressed together and are then rewound about anchor pins 9. Obviously, positioning carriage 6 has been disengaged from its positioning hole near the tube handle and allowed to slide back down tube 1 to a convenient position near spool deck 8 to receive the free ends of tapes 15 and 16.

FIG. 3 is an enlarged view of positioning carriage 6 and the lock lever assembly. In operation, the joined tapes 7 are attached to position carriage 6 by means of anchor pins 9, see FIG. 4. As positioning carriage 6 is manually drawn up along tube 1, the tapes are drawn off of their respective rolls allowing for successive samples to be taken. Positioning holes 2 are spaced such that in moving positioning carriage 6 from one hole to the next hole, a sufficient amount of absorbent tape 15 is drawn across the lower plane of foot 10 to provide an adequate amount of unused absorbent tape to exist between swipes. The result is to isolate contamination samples "swipes" from each other. This isolation insures a more accurate means of monitoring. Stop pin 23 acts as a locking means for positioning carriage 6. Rocker lever 22 is capable of rotating at right angles to the axis of pin 20. Supporting arm 21 is affixed to positioning carriage 6 and provides the supporting base for pin 20. Spring 19 is affixed to both positioning carriage 6 and rocker lever 22. Spring 19 is

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in constant compression; however, sufficient play exists so that further compression of the spring may occur without causing the spring to go beyond its modulus of elasticity. By applying a force towards carriage 6 at the point on rocker lever 22 to which spring 19 is attached, the lever will pivot about pin 20 and cause rocker lever stop pin 23 to move outward from carriage 6. In this manner, stop pin 23 is disengaged from its current positioning hole, thus freeing carriage 6 for movement. By removing the force applied at the spring end of rocker lever 22, spring 19 will force the lever to pivot about pin 20 in a counter-clockwise direction, thus causing stop pin 23 to engage a positioning hole upon alignment of the pin with the hole. Consequently, the locking lever assembly (19, 20, 21, 22, 3) rigidly positions positioning carriage 6 selectively along tube 1.

FIG. 4, is a partial section of positioning carriage 6 exposing the carriage alignment slot and the alignment pin. Carriage alignment slot 3 is a slot milled along tube 1 opposite to positioning holes 2 and extending only along that portion of tube 1 which has positioning holes. Alignment pin 5 rides within alignment slot 3 and is affixed to positioning carriage 6. Alignment pin 5 prevents any rotation of positioning carriage 6 about tube 1. Anchor pins 9 also shown and a proposed method by which joined tapes 7 may be threaded about the pins to create a firm adhesion dependent upon tension between the tapes and the positioning carriage. FIG. 4 also represents a locked position of the lock lever assembly.

In operation, absorbent tape 15 is rolled off and passed over foot 10 and fed through the compressive means which, in this embodiment, is a "roller-block" (14, 13) arrangement and threaded about anchor pins 9. Contact tape 16 is also fed through the "roller-block" arrangement and affixed to absorbent tape 15. Positioning carriage 6 will be positioned at the positioning hole nearest spool deck 8 and locked into place by lever assembly 19, 20, 21, 22, and 23. A "swipe" is then taken of a desired surface. Before taking the next "swipe," rocker lever 22 is depressed at spring 19 disengaging stop pin 23 with its respective positioning hole. The positioning carriage is then manually pulled up tube 1 until the next positioning hole can be engaged by stop pin 23. In this manner, successive "swipes" may be taken quickly, with little fatigue encountered by the attendant, and the "swipes" once taken are protected from inadvertent pollution.

We claim:

1. A contamination sampler comprising:

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- (a) an elongated structural support member terminating in a foot;
- (b) a spool deck affixed to said structural support member adjacent said foot;
- (c) a first tape means carried by said spool deck and extending over said foot whereby contaminants are absorbed as said foot and said first tape means swipe across an exposed surface;
- (d) a second tape means carried by said spool deck;
- (e) compressive means affixed to said spool deck comprising a roller and a mounting block over which both said tape means pass and said first tape means is masked by said second tape means as both tape means pass through said compressive means;
- (f) a resilient block affixed to the end of said structural support member opposite said foot over which said first tape means pass;
- (g) a positioning carriage movable along said elongated structural member to which said tape means are attached; and
- (h) fastening means affixed to said positioning carriage capable of temporarily affixing said positioning carriage to a location along said elongated structural support member.

2. A contamination sampler as described in claim 1 wherein the fastening means affixed to said positioning carriage further comprises:

- (a) a supporting arm affixed to said positioning carriage;
- (b) a pin affixed to said supporting arm;
- (c) a rocker lever pivotal about said pin;
- (d) a spring in constant compression affixed to said positioning carriage and to an end of said rocker lever; and
- (e) a stop pin affixed to the end of said rocker lever opposite to the end to which said spring is affixed.

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