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United States Patent: X-Ray Grain Inspection Apparatus

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This invention relates to an improved apparatus for use in the X-ray inspection of samples of grain or seeds to determine internal insect infestation and other internal physical anomalies. It particularly relates to a novel film cassette and sample holder which helps produce a clear radiograph of the sample which is held in an orderly alignment, thereby permitting rapid visual inspection and analysis.

Your petitioners have developed techniques by which the presence and degree of insect infestation of grain or seed is determined by X-ray radiography of grains or seed samples. In applying these techniques the equipment consists of an X-ray machine, an X-ray film in a light-tight container or film "cassette" and a tray or sample holder which holds the grain sample. Because of the difference in X-ray absorption between an infested seed and a non-infested seed it has been found desirable to expose the film in a light-tight cassette so that the image would not be affected by environmental conditions.

The face of the cassette which also comprises the holder must be of a material which is relatively transparent to soft X-rays. Ideally, the sample holder should have greater X-ray transparency than the sample to be X-rayed, thereby producing a dark background for the developed film.

The face of the cassette which also comprises the sample holder or alignment tray must therefore be light-tight, geometrically thin and have great X-ray transparency.

In the drawings:

Figure 1 is a diagrammatic illustration in section of the essential elements of an X-ray grain testing apparatus according to the invention showing the relation between the various elements of the apparatus.

Figure 2 is a perspective view of a combination cassette-sample holder according to the invention.
of said recesses having a depth approximately that of one granule of said sample.

2. In an X-ray grain inspection apparatus, in combination, a film cassette and a sample holder, said sample holder forming one face of said cassette, being formed of a thin, homogeneous material having high X-ray transparency, and being provided with a plurality of grain holding recesses, each of said recesses having a depth approximately that of a kernel of said grain.

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