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[Continued on next page]

(54) Title: A TRIBOELECTRIC X-RAY SOURCE

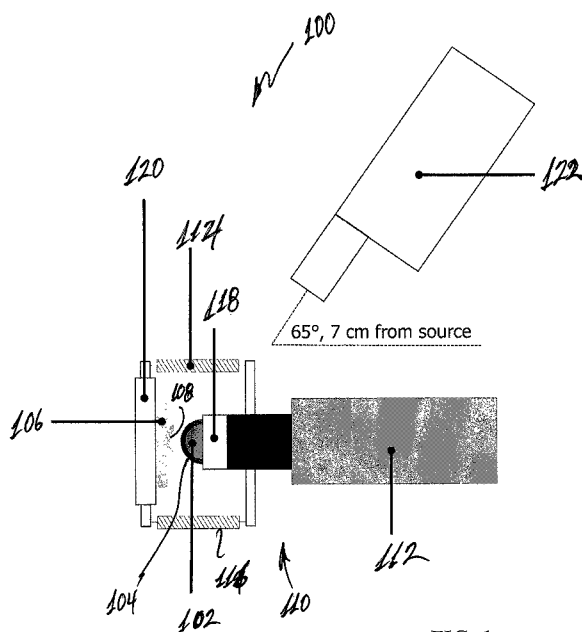


FIG. 1

(57) Abstract: An x-ray source for generating x-rays with at least one narrow energy band includes an enclosing vessel, a first contact arranged with a first contact surface in the enclosing vessel, a second contact arranged with a second contact surface in the enclosing vessel, and an actuator assembly operatively connected to at least one of the first and second contacts. The actuator assembly is structured to cause the first contact surface and the second contact surface to repeatedly come into contact, and separate after making contact, while in operation. The first contact surface is a surface of a first triboelectric material and the second contact surface is a surface of a second triboelectric material, the surface of the first triboelectric material having a negative triboelectric potential relative to the surface of the second triboelectric material. The second contact includes a material that includes an atomic element in its composition that has an excited quantum energy state that can be excited by electrons traveling from the first contact surface to the second contact surface such that the atomic element emits x-rays having an energy within the at least one narrow energy band upon transition from the excited state into a lower energy state. The enclosing vessel is structured to provide control of an atmospheric environment to which the first and second contact surfaces are exposed.



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