

film static or low frequent measurements can not be carried out piezoelectrically, so for this range of application the possibility of capacitive measurement according to the invention is a particular advantage.

FIG. 10 shows a measuring strip 59 having a measuring sensor element made of a flexible piezoelectric film 54 connected to an electrically insulating strip 55. For taking off charge leads or printed leads 56 and 57 are directly connected to (not shown) contact layers of film 54.

FIG. 11 shows an arrangement of a measuring strip 59 according to FIG. 10 on pipe 58, whereby charge take off leads 56 and 57 are only schematically indicated. Measuring strip 59 embraces pipe 58 totally. The described transducer may be used for instance to register the pulse of humans or animals.

FIG. 12 shows a measuring sensor element 60 with flexible film 61 being connected to electrically leading contact layers 62 and 63 by frictional connection or by an electrically leading adhesive. Contact layers 62 and 63 may be made advantageously like a printed circuit using copper coated flexible laminates 64 and 65. The measuring signal is taken off at poles 66 and 67. For easy mounting of the sensor element at the object to be measured self-adhesive foil 68 is provided.

FIG. 13 shows an example of application of a measuring sensor element 60 as shown by FIG. 12, being arranged at the front side of a pipe 69, for instance for measurement of effusion phenomena, with this arrangement especially determination of the instant of escape of non-steady supersonic flow is easily made possible.

FIGS. 14 and 15 show an example of application of a transducer having a number of single transducers integrated to a unit. The transducer may be applied for measurements to determine pressure or pressure distribution within pipe 70 having bores 71 between its inner and outer surfaces. The described measuring sensor element may also serve for temporal pressure registration within hollow bodies changing temporally their shape due to forces acting within the body as is the case with deforming or burning explosive materials.

The measuring sensor element principally has the same structure as that of FIG. 12. Self-adhesive foil 72 closes bores 71 and carries a copper coated flexible laminate 73. A continuous copper layer 74 forms one pole of the measuring sensor element built by a flexible film 75. Connection of the pole to a measuring lead is made over a free end 76 of copper layer 74. Flexible film 75 on the one hand is in connection with copper layer 74 and on the other hand with electrically leading surfaces 77. For recordation of local and temporal pressure distribution measuring signals are taken off at a number of contact surfaces 77 arranged in intervals along the longitudinal axis of pipe 77. Contact surfaces 77 may be made for instance like a printed circuit using copper coated flexible laminates 78 whereby the support layer simultaneously serves as a protective cover for the measuring sensor element. The measuring signals of the single measuring sensor elements covered by contact surfaces 77 may be taken off at the free end 76 of copper layer 74.

We claim:

1. An apparatus for determining the pressure of a fluid, said apparatus comprising means forming a hollow enclosure in which the fluid whose pressure is to be measured is contained, said means including a wall member which has an edge

surface that is configured to provide a cylindrical orifice that communicates with the interior of said hollow enclosure, said edge surface of said wall member including a continuous step portion which extends into said cylindrical orifice and a threaded portion, said step portion being positioned closer to the interior of said hollow enclosure than said threaded portion,

a domed membrane which has a diameter that is greater than the diameter defined by the step portion of said wall member, said domed membrane being positioned in said cylindrical orifice such that the periphery thereof is positioned between said step portion and said threaded portion of said wall member and is oriented such that the center thereof is positioned further from the interior of said hollow enclosure than said periphery,

a transducer means which has opposite ends and is positioned against the domed membrane on the side thereof facing away from the interior of said hollow enclosure, said transducer means comprising at least one flexible piezoelectric film, at least one flexible piezoelectric film in said transducer means having opposite sides and an electrically conducting surface associated with at least a portion of at least one of the opposite sides thereof,

attachment means for stretching said transducer means across said domed membrane and thus across said orifice, said attachment means comprising an annular screw which has a threaded outer surface, said threaded outer surface of said annular screw being engaged with the threaded portion of said wall means such that the annular screw will cause the opposite ends of said transducer means to be clamped and the transducer means to be stretched over said domed membrane.

2. The apparatus as defined in claim 1, wherein a contact ring is positioned between said annular screw and the opposite ends of said transducer means.

3. The apparatus as defined in claim 2, wherein an electrically-conducting washer is positioned between the domed member across which the transducer means is stretched and the step portion of the wall member forming said orifice.

4. An apparatus for determining the pressure of a fluid, said apparatus comprising

means forming a hollow enclosure in which the fluid whose pressure is to be measured is contained, said means including a wall member which has an edge surface that is configured to provide an orifice that communicates with the interior of said hollow enclosure, said edge surface of said wall member including a continuous step portion which extends into said orifice and a threaded portion,

a domed membrane which has a diameter that is greater than the diameter defined by the step portion of said wall member, said domed membrane being positioned in said orifice such that the periphery thereof is positioned between said step portion and said threaded portion of said wall member,

a transducer means which has opposite ends and is positioned against the domed membrane, said transducer means comprising at least one flexible piezoelectric film, at least one flexible piezoelectric film in said transducer means having opposite sides and an electrically conducting surface associated