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J. H. BLAIR
AIR COOLED PULLEY
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2,707,402

Fig. 1.

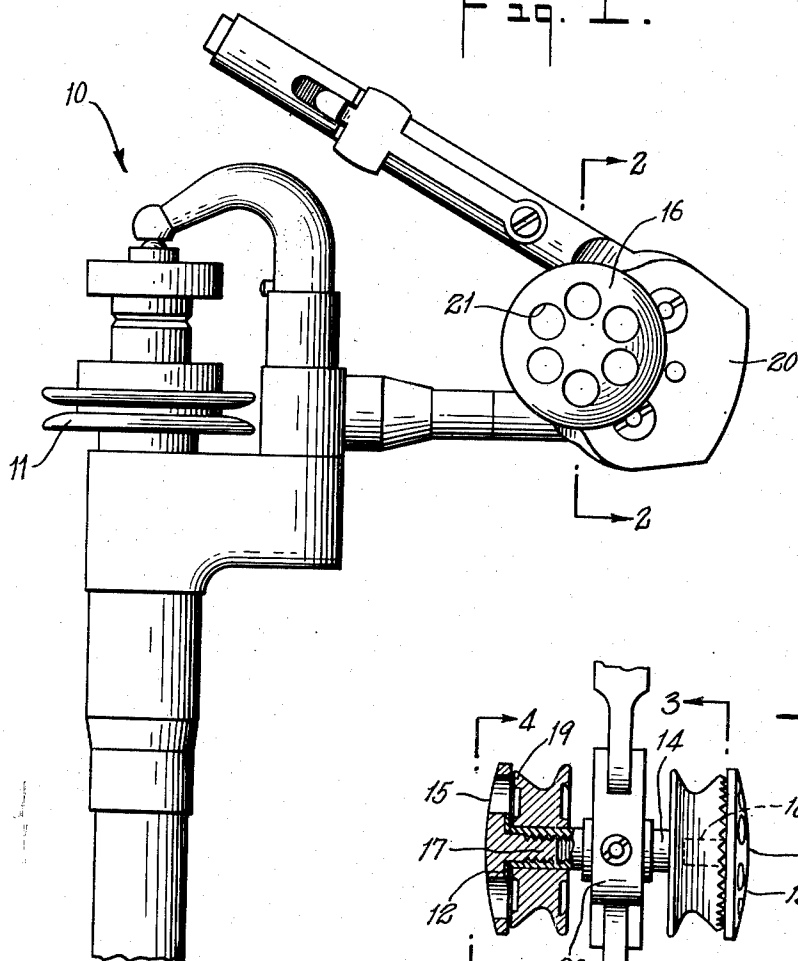
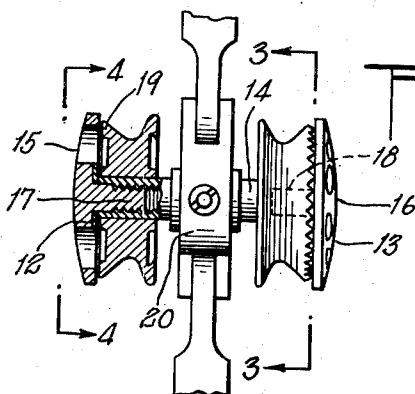


Fig. 2

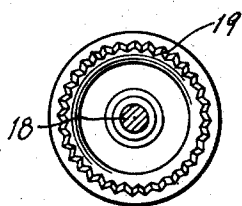


Fig. 3.

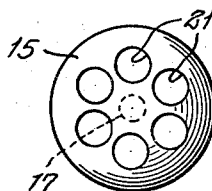


Fig. 4.

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AIR COOLED PULLEY

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4 Claims. (Cl. 74-230.01)

This invention relates to air cooled pulleys and more particularly to a belt driven pulley that is provided with means to induce a turbulence in the air and provide ventilation of the pulley.

An object of this invention is to provide a high speed belt driven pulley that is constructed with a serrated edge to create a turbulence of air in operation and provide a ventilating effect upon the pulley.

A further object of this invention is to provide a high speed belt driven pulley and stationary cover plate positioned in spaced relationship and provided with a means to create a turbulence of air between the pulley and face plate and ventilating means provided in said cover plate.

A still further object of this invention is to provide a high speed belt driven pulley that is positioned adjacent to a stationary cover plate and in which exhaust ports are provided in the cover plate and in which the face of the pulley adjacent to the cover plate is provided with serrations or blades to produce a turbulence or fan effect upon the air surrounding said face.

Other objects of this invention shall be apparent by reference to the accompanying detailed description and the drawings in which

Fig. 1 illustrates a portion of a dental hand piece in which the pulley is a single component,

Fig. 2 is a view partially in cross section taken on line 2-2 of Fig. 1,

Fig. 3 is a side elevational view of the pulley taken on line 3-3 of Fig. 2, and

Fig. 4 is a side elevational view of the pulley cover plate taken on line 4-4 of Fig. 2.

Referring to Fig. 1 there is illustrated a dental hand piece 10. Mounted within this hand piece are a belt drive pulley 11 and a pair of belt driven pulleys 12 and 13. The pulleys 12 and 13, Fig. 2, are mounted in opposed relationship on a central shaft 14, one on each side of the supporting framework 20. The pulleys are retained in a set operating position by means of cover plates 15 and 16. The central shaft 14 is provided with an internal thread at either end thereof and the cover plates 15 and 16 are provided with threaded studs 17 and 18 to fit and thread into the internal threads of the shaft 14. Pulleys 12 and 13 are identical in construction. They are provided with an external face formed with a serrated edge 19. The serrated edge 19 may also be formed as a plurality of small blades or fins to produce the same result. The cover plates 15 and 16 are provided with a plurality of apertures 21 spaced between the center and periphery of the circular cover plate. Referring to Fig. 2 it is apparent that the pulley 12 and cover plate 15 are mounted in a predetermined relationship so that the serrated edge 19 is spaced slightly away from the inner face of the cover plate and slightly below the periphery of the cover plate. This is of the utmost importance as this spacing provides the necessary inlet area for the churning blades or serrations of the pulley to draw the air into the space between the pulley and the cover plate and the churning blades or serrations

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acting as a fan thus forces the air outward through the apertures 21 of the face plate. This induced ventilation under extremely high speed produces an unusual cooling effect upon the pulley proper. It is apparent that the belt driven pulley under unusually high speeds will become extremely hot because of the friction produced between the belt and the pulley. This heat would be conducted through the supporting structure and is not only detrimental to the pulley bearing or supporting axle but would produce heat in the cover plate which may bear against the hand of the operator. But, due to the induced ventilation provided by the pulley, the heat is dispersed in the air stream and the pulley not only has a longer life but provides a cool cover plate which will not burn or cause discomfort to the operator.

Although I have described the high speed air cooled pulley as a component of a dental hand piece, this may be similarly used in conjunction with other devices and may be limited only by the appended claims.

What is claimed is:

1. A high speed V belt driven pulley and a cover plate, said cover plate mounted in a stationary position and spaced slightly from one face of said pulley, the periphery of said pulley formed as a solid V formation to receive said V belt, said face of said pulley adjacent to said cover plate provided with a serrated edge, said serrations shaped to create a turbulence of air during rotation and said turbulence providing a ventilating effect upon said pulley.

2. A high speed V belt driven pulley in combination with a protecting stationary mounted cover plate, said pulley having its periphery provided with a solid V formation to receive said V belt, said pulley provided with serrations around the periphery of one face, said serrations providing a blade effect to create a turbulence of air during rotation said cover plate provided with a plurality of ventilating apertures, said cover plate positioned adjacent to the side of said pulley provided with serrations, said pulley and cover plate spaced a predetermined distance apart to provide an inlet aperture for air around the periphery of said pulley, and means to form said serrations so that they will provide a forced ventilating draft between the pulley and the cover plate.

3. A high speed V belt driven pulley in combination with a protecting stationary mounted cover plate, said pulley having its periphery provided with a solid V formation to receive said V belt, said pulley provided with serrations around the periphery of one face, said serrations shaped so that a plurality of the faces of the serrations create a turbulence of the air during rotation said cover plate provided with a plurality of ventilating apertures, said cover plate positioned adjacent to the side of said pulley provided with serrations, said pulley and cover plate spaced a predetermined distance apart to provide an inlet aperture for air around the periphery of said pulley, and means to form said serrations so that they will provide a forced ventilating draft between the pulley and the cover plate.

4. A high speed V belt driven pulley in combination with a protecting stationary cover plate, said pulley having its periphery provided with a solid V formation to receive said V belt, said pulley provided with serrations around the periphery of one face, said serrated face of said pulley positioned adjacent to and spaced slightly from said cover plate, said serrations shaped to create a turbulence of air during rotation, said cover plate positioned adjacent to the side of said pulley provided with serrations, said stationary cover plate provided with a plurality of ventilating apertures, and means to form said serrations so that they will provide a forced ventilation around and through the cover plate.

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