

UNITED STATES PATENT OFFICE.

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ANGLED HANDPIECE.

1,380,717.

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To all whom it may concern:

Be it known that I, CLAUDE A. HERMAN, a citizen of the United States, and resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Angled Handpieces, of which the following is a specification.

The object of this invention is to provide a handpiece with an interchangeable section adapted for connection at right angles and provided with a tool gripping means whereby more convenient manipulation may be had for operation upon certain classes of work which will not accommodate the conventional handpiece.

More specifically the invention resides in the provision of a yoke which is provided with means for connection with the usual handpiece and having a transverse opening in which is seated a tool carrier, the entire arrangement being removable.

Other objects will more clearly hereinafter appear particularly by reference to the accompanying drawings forming a part of this specification and wherein like parts are designated by corresponding characters of reference throughout the several views, in which:—

Figure 1 is a side elevation showing a grinding wheel applied to the handpiece.

Fig. 2 is a longitudinal sectional view showing the angle attachment in position.

Fig. 3 is a sectional view on line 2—2 of Fig. 2,

Fig. 4 is a side elevation, parts being shown in section, of the handpiece and an attachment similar to that illustrated in Fig. 1, and

Fig. 5 is a sectional view of a clamp for attaching a grinding stick to the handpiece.

In the drawing A— represents a cylindrical casing having a suitable gripping surface and in which is arranged the rotatable stem B— formed with axial sockets C— and D—. The socket C— is arranged for the reception of the driving shaft E— which connects with any suitable power and is locked in position by means of the set screw e— which passes through a threaded opening formed in the stem and is provided with the key-e'— in place of the usual head. This screw e— is locked against rotation by means of the ring c— which is formed with a longitudinal groove c' in which the said key e' seats. An in-

ternally threaded lock ring c'' is arranged to prevent the longitudinal movement of the ring c by threaded engagement with the end of the stem B, the latter being provided with threads for that purpose.

The outer end of the stem B is of reduced diameter and is threaded for the reception of the various tool clamps or the drive gear E' as will more clearly be illustrated. Referring more particularly to Fig. 2 it will be seen that the drive gear E' which is threaded on the end of the stem B and in mesh with the gear H drives through the medium of this gear the stem K the latter being arranged at right angle to the stem B and carrying the tool socket J. This stem K is housed within the cylindrical casing F, the latter being carried by the yoke f and being seated within the transverse annular passage formed by the wall f'. The yoke f is of hollow cylindrical form and receives the outer end of the casing A, being clamped to the casing by means of the clamp ring f''. It will be seen that a communicating passage g is arranged between the transverse annular passage and the interior of the yoke body whereby the gear H threaded on the stem K may mesh with the gear E' carried on the end of the stem. Ball bearings L are shown between the casing A and the stem B near each end to permit and facilitate the rotation of the stem. A felt packing b is provided in a pocket between the casing and stem as shown in Fig. 2. Similar ball bearings L' are provided for the stem K, the lower set of bearings being between the shoulder l and the beveled lower end of the casing G and the upper set being between the upper face of the gear H and the annular bearing plate V'. A nut V'' threaded on the upper end of the stem K locks the bearing plate V' and other parts in place.

When the angle attachment renders an operation inconvenient it may be detached by unclamping the yoke from the sleeve A. The gear E' can then be unscrewed from the end of the stem B and a tool or grinding wheel carrier of any of the forms illustrated in Figs. 1, 4 or 5 can be substituted. The tool or grinding wheel carriers comprise a body provided with an internally threaded socket for the reception of the end B, and a tool or grinding wheel securing means.

Referring to Fig. 4 the body M of the

carrier has formed at one end the annular shoulder m' against which the grinding wheel N abuts, and at the other end the reduced threaded shank m on which is threaded the nut m'' . A washer N' is interposed between the nut m'' and the emery cloth covered rubber wheel N whereby it is possible to considerably reduce the size of the nut and obtain a greater clamping effect.

10 In the form shown in Fig. 5 there is a nipple P having internal threads at one end for the reception of the externally threaded end of the stem B, and external threads at its opposite end, the latter end also being
15 formed with longitudinal slits p . The locking or clamping ring P' is formed with internal threads for engagement with the external threads on the end of the nipple so that this end may be contracted for en-
20 gagement with the grinding stick p' .

In Fig. 1 there is shown in side elevation an attachment of similar construction generally as that shown in Fig. 4, slightly modified, however, in the extended stem
25 connection Q—to better provide for the use of the large grinding wheel R.

From the foregoing it will be obvious that any type of tool or grinding wheel clamp might be utilized provided same is provided with an internally threaded socket
30 for the reception of the threaded end of the stem. It will be also noted that an interchange from the angled handpiece to the other forms may be made quickly and by
35 the simple removal of the clamp ring p'' and the yoke, and the gear on the end of the stem B. It will also be seen that in each form a strong and durable device is provided and that in no instance is there a com-
40 plicated arrangement of parts.

Various changes in the details and arrangement may be made without changing the nature of the invention, which is more clearly defined in the annexed claims.

45 What I claim as new and useful and desire to secure by Letters Patent, is:—

1. A handpiece comprising a casing, a rotatable stem arranged within said casing formed with a socket in one end for the
50 reception of driving means adapted to rotate said stem, the opposite end of said stem being threaded, and a tool carrier connected to the threaded end of said stem.

2. A handpiece comprising a casing, a rotatable stem arranged within said casing
55 and having driving means adapted to rotate said stem connected at one end thereof, a tool carrier, and means for detachably connecting said stem to said tool carrier.

60 3. A handpiece comprising a casing, a rotatable stem within said casing and a driving shaft connected thereto, a gear carried by one end of said stem, a tool carrier, a rotatable stem arranged at an angle to said
65 first mentioned stem and having a gear fixed

thereto, a casing for the last mentioned stem, means for retaining the gears in mesh, and means for detachably connecting said tool carrier upon said first mentioned rotatable stem.

70 4. A handpiece comprising a casing, a driven stem within said casing, a gear removably secured to one end of said stem, a yoke having a hollow body portion for the reception of one end of said casing and a transverse opening in one end, a communicating
75 passage between the hollow body and said transverse opening, a rotatable tool carrier fitted in said transverse opening and having a driving gear fixed thereto and in mesh
80 with the gear on the said stem, and means for locking said tool carrier in said casing.

5. An attachment for handpieces comprising a yoke, having a hollow body for the reception of driving means and a transverse
85 opening in one end, a casing extending through said transverse opening, a stem having an expansible tool socket in one end arranged for rotation within said casing, a gear fixed to said stem, said gear being operatively connected to the driving means in
90 said hollow body, and means for locking said stem in said body.

6. A handpiece for tools comprising a casing, a driven stem arranged within the
95 casing, a bevel gear detachably secured to one end of said stem, a tool carrier arranged at right angles to the longitudinal axis of said stem and having a bevel gear fixed thereto, a casing for said tool carrier formed
100 with a passage to permit the engagement of said gears, and a yoke inclosing said last mentioned casing to clamp the casings together.

7. A handpiece for tools comprising a casing, a rotatable stem within the casing and
105 having a gear fixed at one end and being adapted for connection with driving means at the other end, a yoke having a hollow body for the reception of one end of said casing and being formed with a transverse pas-
110 sage, a communicating opening formed between the said hollow body and transverse passage, means for clamping the yoke body to said casing, a casing arranged within the
115 transverse passage and being formed with an opening adapted to register with the communicating opening, a tool carrier rotatably mounted within the last mentioned casing and having a gear fixed thereto in engage-
120 ment with the gear on said stem, and means for securing the tool carrier in said casing.

Signed at Bridgeport, in the county of Fairfield and State of Connecticut, this 2nd day of June, A. D., 1920.

CLAUDE A. HERMAN.

Witnesses:

C. M. NEWMAN,
LILLIAN M. ALLING.