

ABSTRACT

IN-SERVICE MAINTENANCE PROCESS USING UNMANNED AERIAL VEHICLES

5 Methods (200) for performing repair operations using one or more
unmanned aerial vehicles (UAVs). First, an unmanned aerial vehicle equipped with
a camera (30) is flown to a position in a vicinity of an area of interest on a surface
of a structure (18). Image data representing one or more images of the structure
(18) in the area is acquired using the camera (30). Second, an unmanned aerial
vehicle equipped with a non-destructive examination (NDE) sensor unit is flown
10 until the NDE sensor unit is within measurement range of the structure (18) in the
area of interest. Then NDE sensor data representing structural characteristics of
the structure (18) in the area of interest is acquired. Third, an unmanned aerial
vehicle equipped with a repair tool is moved to a location that places the repair tool
in contact with the surface in the area of interest. Then the structure (18) in the
15 area is repaired using the repair tool. Once the repair has been completed, a UAV
equipped with a camera (30) or an NDE sensor unit may be used to determine
whether the repaired structure (18) should be placed back in service or not.

FIG. 10