make paper motor rotate

$ echo 1 > /sys/class/dcmotor/paper/run

in driver/dcmotor/dcmotor-mod/dcmotor_sys.c

```
1.  static ssize_t dcmotor_run_store(struct device *dev,
2.          struct device_attribute *attr, const char *buf, size_t size)
3.  {
4.          ssize_t status;
5.          long speed;
6.          dcmotor_t *dcmotor = (dcmotor_t *)dev_get_drvdata(dev);
7.
8.          mutex_lock(&sysfs_lock);
9.          status = kstrtol(buf, 0, &speed);
10.         if (status == 0) {
11.                 status = dcmotor_run(dcmotor, speed);
12.                 if (status == 0) {
13.                         status = size;
14.                 }
15.         }
16.         mutex_unlock(&sysfs_lock);
17.
18.         return status;
19. }
20. static DEVICE_ATTR(run, 0644, dcmotor_run_show, dcmotor_run_store);
```

当echo 1 > run ==>

dcmotor_run(dcmotor, 1)

How to stop rotating dc motor ?

$ echo 0 > run

stop running dc motor

in dcmotor.c/dcmotor_run()

```
1.          if (speed == 0) { /* off case. */
2.                  dcmotor_halt(dcmotor);
3.                  (*dcmotor->enter_sleep_func)(dcmotor);
4.                  dcmotor->target_speed = dcmotor->current_speed = &dcmotor->dcmoto
    r_speeds[speed];
5.                  return 0;
6.          }
```

```
1.  static void dcmotor_halt(dcmotor_t *dcmotor)
2.  {
3.
4.
5.          /* Sanity check on the motor id */
6.          if (!valid_dcmotor_ptr(dcmotor)) {
7.                  dbg1(("%s: Invalid motor ptr (%p)\n", __func__, dcmotor));
8.                  return;
9.          }
10.
11.         /* Disable all motor interrupts */
12.         dcmtr6pin_int_disable(&dcmotor->reg_iface);
13.
14.         /* Set pwm duty cycle to 0 */
15.         dcmotor_no_pwm(dcmotor);
16.
17.         /* Disable all PWM outputs to prevent accidental PWM application */
18.         /* Turn off motor by reseting MCFG EN bit */
19.         set_dcmtr6pin_motorconfig_enable(&dcmotor->reg_iface, DCMTR6PIN_MCFG_DISA
    BLE);
20.
21.         /* Now that the motor block is disabled, turn off the PWM watchdog */
22.         dcmtr6pin_pwm_wdog_disable(&dcmotor->reg_iface);
23.
24.         /* Now in stopped state (warning: motor could still be moving) */
25.         dcmotor_set_motor_state(dcmotor, MOT_STATE_STOP);
26.  }
```

上面真正令dc motor stop的是

```
        /* Set pwm duty cycle to 0 */
        dcmotor_no_pwm(dcmotor);
```

```
static void dcmotor_no_pwm(dcmotor_t *dcmotor)
{
        /* The first step is to apply 0 PWM as usual */
        dcmotor_pwm_control(dcmotor, 0, false);

        /* Clear the motor enable.  Note that not all PWM methods use motor enable
         * (it will not be mapped in the connect table); the 6-pin driver will simply
         * ignore it if not mapped.
         */
        set_dcmtr6pin_pin_to_state(dcmotor, DC_PIN_FUNC_EN, 0);
}
```

static void dcmotor_pwm_control(dcmotor_t *dcmotor, uint32_t reg_duty_val, bool update_duty_val)

reg_duty_val : 0

update_duty_val : false

该函数中stop dc motor的code就是下面

    /* Set duty cycle */

    set_dcmtr6pin_pwm_duty(&dcmotor->reg_iface, reg_duty_val);

==>

    set_dcmtr6pin_pwm_duty(&dcmotor->reg_iface, 0);

把占空比设为0，但dc motor应该还会依惯性转一会儿。

目前的控制目标中并没有多少时间停下来的要求！

How to make immobile dc motor rotate?

```
1.          if (dcmotor->dcmotor_speeds[speed].index != 0) {
2.                  /* not stopped */
3.                  if (dcmotor->motor_state != MOT_STATE_STOP) {      ①
4.                          dcmtr6pin_int_disable(&dcmotor->reg_iface);            ②
5.                  } else {
6.                          (*dcmotor->exit_sleep_func)(dcmotor);
    ③
7.                  }
8.                  dcmotor->target_speed = &dcmotor->dcmotor_speeds[speed];
9.                  dcmotor_set_motor_move_params(dcmotor, dcmotor->dcmotor_speeds[sp
    eed].move_params);
10.                 /* Reset the completion in case last run command did not issue a
11.                    wait command.  Don't want a false at speed notification */
12.                 reinit_completion(&dcmotor->at_speed);                    ④
13.                 dcmotor_add_trigger(dcmotor, TRIG_STATE, MOT_STATE_STEADY, dcmoto
    r_at_steady_state);    ⑤
14.                 mot_dc_run(dcmotor);            ⑥
15.         } else { /* off case. */
```

①

当前motor还在转，比如对mirror dc motor而言，有两级rotating speed。当当前运行在speed 1,而发出切换到speed 2时就是这种状况。

或者motor还在转，处于MOT_STATE_COAST阶段。

②

diable dc motor's interruopt。由于整个feadback control是由interrupt驱动的，disable interrupt后也就无效了。

③

如果原来的dc motor处于immobile状态，则调用退出sleep的callback，因为motor要转起来了!

④

初始化completion的同步机制。

⑤

设置转速达到稳定后的trigger function。该function就是释放completion。

该completion可以用于等待motor转速达到steady。

比如：

$ echo 1 > /sys/class/dcmotor/paper/run # startup motor

$echo 100 > /sys/class/dcmotor/paper/wait # wait 100ms before motor speed steady

⑥

真正使motor开始rotate的function。

???